

NEW SYSTEM  
OF  
ARCHITECTURE,  
FOUNDED ON  
THE FORMS OF NATURE,  
AND DEVELOPING  
THE PROPERTIES OF METALS;  
BY WHICH A HIGHER ORDER OF BEAUTY,  
A LARGER AMOUNT OF UTILITY,  
AND VARIOUS ADVANTAGES IN ECONOMY,  
OVER THE PRE-EXISTENT ARCHITECTURES,  
MAY BE PRACTICALLY ATTAINED:  
PRESENTING ALSO,  
THE PECULIAR AND IMPORTANT ADVANTAGE OF BEING  
COMMERCIAL,  
ITS PRODUCTIONS FORMING FITTING OBJECTS FOR  
EXPORTATION.

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WILLIAM VOSE PICKETT.

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LONDON:—LONGMAN & CO.

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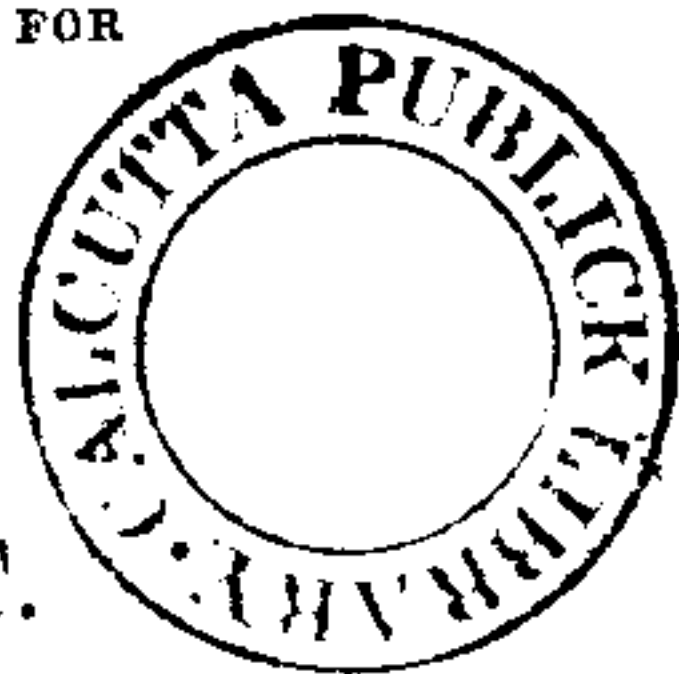
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## PREFACE.

THE first idea of the System of Architecture, the primary principles of which are herein set forth, occurred to the mind of its author on visiting a few years since the stalactitic caverns of Derbyshire. He was then struck with the exceeding beauty, and applicability to the purposes of Architecture, of the forms exhibited, not alone in these most interesting productions of inanimate, but also in those of animated nature in general. But, upon considering the possibility of rendering the various combinations of these descriptions of forms subservient to the practical purposes of that art, he found the ordinary material of *stone* entirely unfitted for the required end. He therefore naturally turned to *metals*, as furnishing the requisite means for the fulfilment of the desired object; and also as presenting most useful and most efficient constituent materials for the comprehensive purposes of the entire art.

This conclusion was arrived at, first, by an examination into the nature of metallic productions, and the capability of these bodies for the realization of peculiar beauty; and secondly, from the evidences of their perfect and satisfactory applicability to numerous synonymous purposes, especially those of bridge-building, and above all, ship-building, to which they are now so

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extensively applied, and for which strength, durability, non-combustion, economy of space, facility in construction, and general comfort and convenience, united with cheapness, must of necessity form the principal recommendation; as but little taste is exhibited in *naval* in comparison with *civil* Architecture; or in other words, the adoption of cast-iron for the building of ships is not on account of the capability of that material for producing peculiar beauty, but in consequence of its possessing those decidedly *useful* properties, which should equally recommend its application in the erection of dwellings, and other edifices on land.

On examining further into the nature of the numerous manufactured substances employed in the practices of existent Architecture, he found them equally applicable as substitutes for its legitimate material, to the purposes of a genuine *metallurgic* as to those of *masonic* Architecture, whenever any superiority in economy or other advantage might recommend their adoption.

Having therefore, reduced his original idea into a clear and definite "code of laws," the fulfilment of which would necessarily involve the establishment of a new art in Architecture; because laws of such a nature have never yet been known to govern the practices of any system of Architecture; and having tested their justice and practicability by a requisite course of experiment,—which also perfectly convinced him of the possibility of producing by these means a beauty in effect superior to that in any other Architecture, and of combining with that beauty *all* the necessary utilities required of the art,—he became desirous of surrendering his discovery for the benefit of the public. But having devoted several years and incurred considerable expense in the pursuit of

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the necessary experiment, he felt himself unable in justice to do so, without a previous guarantee of some species of indemnity for his disclosure.

Under these circumstances, application was made during the year 1843, in rotation, to the several leading institutions in London, professing to take cognizance of and encourage art,—all of which declared their inability to meet the exigencies of the case.

On appealing to Her Majesty's Government, a similar reply was given,—“it was not their duty or custom to encourage inventors.”

There now, therefore, appeared no other alternative but to throw himself on those more generous governments of the Continent, whose policy it is, in contradistinction to our own, to give that countenance and support to the authors of useful inventions, which may enable them to withstand the combinations of opposing prejudice, or fanciedly injured interests, which here are too frequently permitted to accomplish their ruin.

It is, indeed, proverbial, that while England has derived more advantages from *invention* than any other country in the world, her *inventors* receive little else than neglect and injustice during life, while their countrymen make all smooth with their consciences by *giving themselves* monuments to their memories when dead.

The illustrious Harvey, the discoverer of the true circulation of the blood, found his practice fall off on the promulgation of his discovery. He was so far treated with neglect, as not to have even one individual to attend his lecture; and it is recorded that during his life-time no physician was known to have received his



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doctrine who was upwards of forty years old. And yet this doctrine was such, as that now the whole medical world would be ashamed to acknowledge any other.

Watt, again, the persevering Watt, to whom we are indebted for the steam engine, was treated with similar neglect; and after the devotion of fourteen years to experiment, during which time neither government nor any other institution was found to assist him, he was almost abandoned to despair. The result of his labors might have descended with him to the grave, had it not been for the liberality and patriotism of a private individual,—and yet, what does not England owe, and what will she not ultimately owe to the steam engine?

But to resume. Hitherto the author of this System of Architecture, and his professional friends, had been accustomed to view his discovery in no other light than as “a new fine art,” which must from its own nature (to a certain extent, at least) be free. But having taken legal opinion, and ascertained that in so far as it embraced the application of certain and definite mechanical principles which had never before been uniformly and systematically applied to the purposes of Architecture; and above all, had clearly a purpose and intention in its effects unpossessed by any known and commonly practised Architecture; the system, as a system, was capable of being protected by the law of patent, he availed himself thereof.

To this step he was prompted by several considerations: first, because the laws and institutions of this country offer no other means of protection to the discoverer of “a new fine art” in Architecture. Yes, unless a discovery, vast and metaphysical in its nature as an integrally new system of Architecture must ne-

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cessarily be, shall be brought *at once* to the vulgar point of mechanical economy and profit,—the individual whose destiny and (being gifted with the power) whose duty it is to work it out, has no hope whatever presented to him. He dare not avail himself of assistance, he dare not ask advice, or consult opinion, from fear of his invention becoming known, and of his being deprived of the merit as well as reward to which he was justly entitled; and after the devotion of years, and the waste of strength in mental effort and almost overwhelming anxiety,—after all his expense in experiment, and in purchasing, dearly purchasing, (and this only for a limited period) a species of protection which perhaps he does not require, but to which he is compelled to resort, because the law *denies* to *metaphysical* labor the protection it *freely gives* to *mechanical* labor, and to every individual in the meanest of his *physical* possessions—the uninformed, the unprincipled, and the avaricious, will doubtless violate his patent, and involve him in expensive legal proceedings (and all the mental distractions consequent thereupon, and so prejudicial to artistic effort) in order to defend that right,—before perhaps he himself has received any recompense whatever in return for all his labors, disappointments, and sacrifices.

These animadversions on the state of English law and custom, are not here put forth for the unworthy object of endeavouring to recommend “a System of Architecture,” through the agency of individual sympathy,—but for the purpose of directing attention to the fact, that all the higher classes of discoveries are either wholly unprotected, or are so in a far less efficient manner than those of the most simple mechanical character,—and of suggesting an enquiry, as to whether the continuance of such a state

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of things is consistent with justice, and sound policy, as regards the interests of the community at large.

But, nevertheless, the second consideration which prompted him to avail himself of patent, was his duty as a British subject, and the natural desire he felt that his own country should be the first to derive benefit from this art; and thirdly, the certain conviction that England, above all other nations, possesses within herself the most ample and efficient means for its accomplishment.

The restrictions necessarily imposed by this state of things have not therefore arisen from the choice of the author, who, while presenting the public with a new fine art, (which cannot in its metaphysical sense, or so far as artificial representation is concerned, be limited in its exercise by any patent right,) would willingly also have placed the *practical operations* thereof on precisely the same footing as those of the other Architectures; had the institutions of his country enabled him to do so on any other condition than those of self sacrifice.

The inconveniences resulting to the profession or the public from these restrictions, are, however, of an exceedingly trivial character; and a peculiar advantage is in one respect attendant upon them, inasmuch as they leave a power in the hands of the originator of the art, of limiting his licenses to such persons as shall prove themselves competent for the efficient practice of it; and may so become the means of protecting the art itself from corruption, and the public taste from becoming vitiated or offended by the erection of impure and imperfect examples.

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In a very short time, several experimental models, etc. in illustration of the principles explained in the succeeding chapters, will be ready for exhibition in London, to which the especial attention of architects, amateurs, and general practitioners in art, is respectfully invited. And if in the mean time, any artist should find himself prompted by the impulses of genius, to produce illustrations of the system contained in this book; the author will feel most happy to be favored with an opportunity of adding the same to the little collection of experiments he hopes to have the honor of submitting; and sincerely trusts that the singularly unfortunate condition in which the art of Architecture is placed, in reference to the exhibition of designs and models, will not be the means of deterring any from the attempt. At a time when Architecture in general is practised to the extent to which it has long been amongst ourselves, it must indeed be subject of astonishment to foreigners, that we are still so situated, that if any individual was disposed to present to the nation, for the benefit of the public, a series of models or designs, (whether in illustration of this new art or of any of the elder architectures) there is no place whatever to receive and deposit them in. Amidst all our either annual or permanent exhibitions of art, there is not one for experimental Architecture; and all the space that is allotted to this, the most important, the most useful of the fine arts, is but a portion of one of the smallest rooms at the Annual Exhibition of the Royal Academy. Such a state of things, indeed, is sufficiently discouraging to artistic effort; but, nevertheless, it is an evil which may, and it is sincerely hoped *will*, shortly be removed. And it is not by supineness and indifference to the real advancement of art on the part of the architect and artist, but only by the

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active exertion of genuine talent, that he can either expect or deserve the efforts of those who would assist in procuring for him “a fitting repository” for his productions, and so facilitate the just reward of his labors.

WILLIAM VOSE PICKETT.

Tottenham, Middlesex,

March, 1845.

## CHAPTER I.

### BRIEF ENQUIRY INTO THE OBJECTS TO BE ACCOMPLISHED IN A NEW ARCHITECTURE.

That the introduction of an “entirely new” and distinct system of Architecture from those hitherto practised, is not only nationally, but universally desirable, no individual acquainted with the past and present state of “art in architecture” can possibly doubt. But the time having now arrived when “a practical answer” may be submitted to the enquiry, “How is a really new Architecture to be accomplished?” and when consequently a plain and simple analysis of the nature of things bearing immediately on this great and important question, will doubtless be deemed more useful and satisfactory than indulging in splendid though but too frequently “vague generalities.” It is not the purpose of the present work to arouse the feelings or passions of its readers, or awaken the just and honourable (although in reference to these things, long humbled) pride of the British Public, by enlarging upon the fact, that England, in common with the now greatest nations of the

continent, *possesses no Architecture she can really claim as her own*,—by descanting upon the circumstance, so humiliating in respect to art, of the whole civilized world being still, in the nineteenth century, almost exclusively engaged in the work of *imitating* and *copying* the productions of nations long extinct, and the state and circumstances of which in respect to climate, religion, government, and the general condition of society, were so widely different from our own;—or, by allusion to the demand which the growing intellect and tastes of the community at large, is already beginning and will undoubtedly continue to enforce, for the production of “an Architecture” in accordance with the spirit of the age, and of this country especially. But waiving for the present all considerations of this nature, we will proceed to the more useful and important task of showing how, and by what means this most desirable object may be attained.

In the first place, it will be necessary to call to mind the true and ultimate intentions of Architecture in general; namely, to produce the “beautiful” in the construction of edifices; to reconcile and associate therewith the various and necessary “utilities” of the structures requisite for the uses and comforts of civilized society; and to produce as great an amount of “variety” in the character and effect of those structures as can be found consistent with beauty and propriety.

Such being the general purposes of Architecture, it is



evident that the *first* and primary object of a *new system*, should be the attainment of a description of "beauty or effect" integrally dissimilar from, and if possible of a higher order, than that exhibited in the pre-existent architectures, or is capable of being produced by any further application or extension of the principles upon which they are based; and *secondly*, the attainment of an equal, and if possible, greater amount of "utility," combined with a capability of producing equal and even greater "variety" in expression ~~or effect~~.

The first and most indispensable concomitant of such beauty is, *a new order of forms*, together with peculiar methods of expressing and combining those forms. Colour, and the various peculiar combinations and modifications thereof, is another concomitant of such beauty in Architecture. And an attention to the various effects of the natural phenomena of *light*, to which the productions of Architecture are peculiarly exposed, may be brought to constitute a third concomitant of distinctive beauty.

The *utilities* requisite to be provided for in a new system of Architecture, are, comfortable modifications of temperature, dryness, durability, cleanliness, and the absence of unhealthful and disagreeable odours; free admission of light, and general convenience and economy of space; security against fire, etc.; facilities in erection; and, if possible, for the removal of structures without the injury or destruction of their respective parts. The former of these,



namely, comfortable modification of temperature, dryness, and durability, are necessarily and in a great measure dependant upon the non-retentive and non-absorbent properties of material; the nature of the constructive principle; and the precautions adopted in the process of erection. Cleanliness, and the absence of unhealthful and disagreeable odours, is also largely affected by these contingencies, and the first of these, perhaps, to a still further extent, by the peculiarities of *form*. The free admission of light, and general convenience and economy of space, is likewise materially affected by form and arrangement. Security against fire, etc. by non-combustive properties of material, and the nature of the "constructive principle." The facilities in erection and removal being dependant also upon the latter, as well as upon peculiarities in the nature and economy of the material. Many, if not all, the most important of these contingencies, must necessarily be reserved for consideration until the materials, the forms, the constructions, and general arrangements of this system, are specifically treated of.

Numerous other contingencies, involving considerations of effect, as well as utility, are however highly desirable to be attained; and in order to assist the determination of the more definitive nature of these, particular attention is in the meantime requested to a few remarks, on the nature and circumstances of the architectures commonly practised throughout Europe, and their general suitability to the

wants and various requirements of modern society, especially in Northern climates.

In so doing, it is by no means necessary to furnish even the most brief and general delineation of the respective characters or retrospect, of the rise, the progress, the various decays, or the more various resuscitations, which the several styles of Architecture commonly practised throughout Europe, have, during the many ages of their existence, been found to undergo. Neither would it accord with the purpose of the present work, to enter into any philosophical examination of the abstract principles upon which masonic art in general is founded, in order to ascertain how far the same were capable of being subjected to different methods of treatment, from those heretofore adopted, and of being applied to the accomplishment of more satisfactory results, in regard to the just demands of genuine art, for the continual production of *originality* and variety in effect; and the demands of modern society, for adaptation to its peculiar wants and circumstances. Such an investigation would be sufficient to form the subject of a distinct essay; and on the present occasion would only serve to divert the attention of the reader, from the nature, value, and importance of "the distinctive principles" forming the basis of "an integrally *new* and *dissimilar* Architecture," which it is the especial intention of this work to explain and set forth.

Suffice it, therefore, to remark, that *all*, and *each*, of the pre-existent styles or systems of Architecture, are *founded*

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on and have especial reference to *the properties and capabilities of the same material*, viz. STONE,—the consequences of which are, that they are not only restricted in respect to the various utilities, comforts, and conveniences, their productions are required to serve,—*but are all to a certain extent synonymous and uniform in their effects and capabilities; inasmuch as the general character of “the design,” and the general character of “the construction,” of their respective works, are, and must be, conformable to the nature and properties of the material so employed.*

It is true that *brick* is occasionally adopted for facilitating constructions, or producing certain modifications of color; yet this can be considered in no other light, than as a meaner substitute for the legitimate material, and must of necessity be employed in subordination to the same principles of design and construction; for with brick alone little or nothing architecturally can be accomplished. Stone, therefore, is the genuine constituent of all Architecture; and so long as we restrain ourselves to the use of this material, there can be but *one* primary principle of construction, namely, that of laying one solid mass upon another,—there can also be but *one* general principle of design for external features, namely, that of “the opaque and attached,” rather than “the transparent and isolated”; and so long as architectural productions are restricted to masonry,—so long will they exhibit the uniform and monotonous color of *one* material, and be liable to the accumulation of dirt, which,

(from the tendency of stone to retain damp and facilitate the growth of vegetation on its surface, as well as from the decorative features of the art being carved in relief, and consequently creating hollows in that surface,) is one of the unavoidable contingencies attendant upon its productions.

It may here be replied, that Architecture possesses the means of counteracting the effect of the dull uniformity of color before alluded to, by the selection of the several varieties of marble, and also by availing herself of the assistance of the ornamental or mechanical arts. The nature of northern climate, however, and the *great expense* at which alone marbles of rich and varied color can be obtained, renders the first of these resources usually unavailing, at least for external purposes; and without entering into the question of the propriety or impropriety of having recourse to paint, gilding, or other foreign applications, in order to remove or counteract the natural effect of stone—the fact of such appliances having to be resorted to, is in itself sufficient proof—that Architecture is *incapable* of completing or fully realizing the ultimate effects required of it, without disguising the appearance and quality of its constituent material, by the interposition of other arts, and other means, than those of its own legitimate attainment.

It is occasionally, and under some few circumstances may be *truly*, urged, that the prevalence of one uniform color, however dull and monotonous, throughout an entire structure, is preferable to any variety of tint or tone that could be in-

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roduced. But this, although sometimes, perhaps, admissible in the case of individual structures, can never, in point of beauty in general effect, be found to hold in that of any extensive assemblage of buildings; as, for example, in the entire Architecture of a vast city, wherein the streets are usually paved with stone, correspondent with the material of its edifices,—where the vegetation which this material (especially in a moist climate such as our's) so freely engenders, forms a cohesive *receptacle* for the soot and dirt with which the atmosphere is charged,—where the ~~most~~ frequent tone the atmosphere is found to assume throughout the year is that of “a dingy grey,” correspondent with the prevailing dirty color and effect of its multitudinous structures,—and where there is so little an interposition of natural and vivid color, in the form of trees and flowers, or a large expanse of sky, to relieve the dreary monotony of the scene.

The foregoing, as also some of the succeeding observations, will doubtless be considered by some as relating to objects of minor importance. However this may be, when viewed individually, they will cease to be so when taken collectively, and in connexion with the wise and useful remark of Michael Angelo,—“that *perfection* consists in attention to trifles; and *perfection* is no trifle.”

Another apparent inefficiency of prevailing Architecture to accomplish in itself, the ends and effects, which the comforts and luxuries of modern society are found to require,

is frequently exhibited in the interior arrangement and completion of palaces, and similar structures for state or dwelling, wherein it is no unusual thing to see marble columns of massive proportions, standing out from walls covered with satin, cloth, paper, or some such fragile and perishable material, having no affinity of character whatever either with the material or design of the entire work.

It may be said, and no doubt justly, that these and similar instances are but *misnomers* in architectural practice; but, ~~however~~ this may be, it is unquestionable, that *the legitimate effects of purely masonic Architecture, are exceedingly difficult to reconcile with strictly DOMESTIC comforts and conveniences.* How far this may be attributable to "the nature of its material," (affecting also, as it necessarily must, the character of its design and construction,) it might be interesting to enquire; it is doubtless largely influenced by the circumstance of all *existent Architecture* having *originated* in application to purposes having *no relation* to "*the domestic.*"

A very important and indispensable utility of the majority of the edifices of a northern climate, is that of warming by means of fire, and the necessary appendage of *chimneys*; and these utilities it is the province of the Architect to convert into beauties, or at least to render harmonious with the general character of his works. That such an end is impossible of attainment in any existent style of Architecture, it would be altogether unjust to assert: but, if the facilities presented by those of "classic origin" were to be estimated

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by reference to the piles of hideous deformity, which are suffered to destroy perhaps *the finest point of effect*, viz., “the *sky* effect,” of a vast majority of our edifices, they would certainly appear (in this respect, at least) exceedingly ill adapted to the peculiar necessities of a northern climate; if a little further investigation did not bring us to conclude, either that the natural laws of combustion, and the effects arising therefrom, are but very imperfectly understood,—that the materials or methods usually employed in the construction of chimneys are incompatible with the ~~nature~~ of those laws,—or that the endeavour is altogether wanting to render them reconcileable.

“Ventilating,” “warming,” by various processes of diffusion and lighting, (whether by the admission of natural, or the interposition of artificial light,) are also “utilities” of essential importance in the majority of structures; the *effects* or *appearance* of which, it is equally requisite, should be conformable with beauty and consistency, in relation to the work as a whole. But, as in the course of the subsequent observations, reference will more particularly be made to these considerations,—we shall here only pause to remark—that it is rather an unfortunate circumstance attendant upon the styles most commonly in use, both for public and domestic purposes, that having originated in comparatively southern countries, where a dry and genial atmosphere renders the close and entire covering of buildings unnecessary; and from the natural warmth of climate,



and the usual length of the days, little need exists either for additional *heat* or *light*,—they are in each of these respects exceedingly barren in "classic example," and appear to present considerable difficulties, in adaptation to the increased and indispensable utilities of less favored climes. The circumstance, also, of *all* the purer and more perfect examples of this art, being public structures, chiefly temples, and other religious edifices, has doubtless tended to increase the difficulties attending its successful application to the ~~parts~~ circumstances, as well as luxuries, of modern domestic life; to which so large an amount of architectural practice is now required to be applied.

The foregoing observations have been made, not for the purpose of casting any imputation on the character of the inventive genius exhibited in modern architectural practice; but for the more worthy and useful object of reminding ourselves of the difficulties, deficiencies, and inconveniences attendant upon existent systems, in order that in the formation and practice of a NEW ONE, we may endeavour to mitigate, if not overcome, these several objections,—and in so doing secure to ourselves the advantages of an Architecture, presenting, in each of the respects before alluded to, (in addition to various others hereafter to be mentioned,) *greater facility of adaptation* to the peculiar circumstances of modern society in general, than is possessed by the Architectures derived from the practices of the ancients,—*in addition* to that of the production of "a new and peculiar order of beauty."

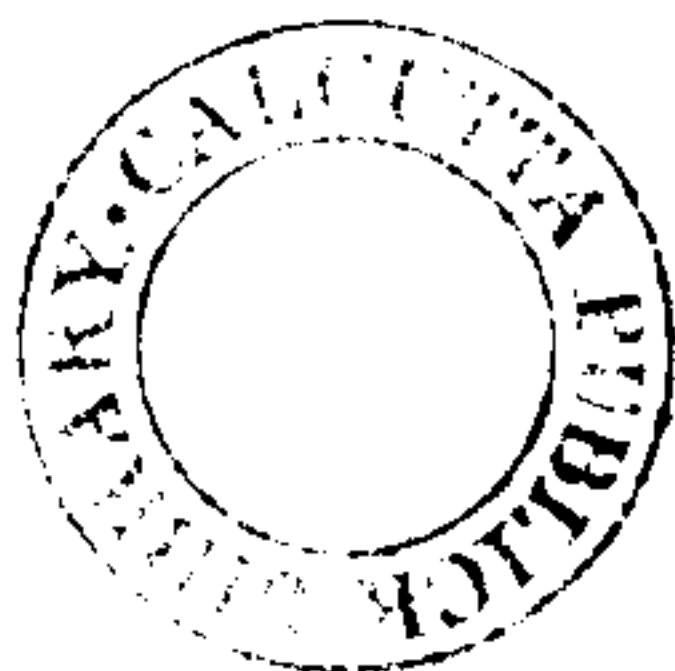


Now it is obvious that *a really distinct and peculiar character of BEAUTY in Architecture, cannot be obtained without the application of "principles of design," and "principles of construction," altogether DIFFERENT from those upon which the existent Architectures are based;* (a requirement which must evidently involve the uniform application of constituent materials, possessing different properties from those previously employed;) and in order to render such principles capable of being consistently applied to the purposes of this art, which invariably demands its productions to ~~exhibit~~ uniformity of character in their effects, it is absolutely indispensable that they be capable of uniform and consistent application, throughout *the entire range* of the operations of the art; without which capability, in fact, no such principles could possibly be made the basis of "*a new Architecture.*"

It is by no means necessary that these principles, either of design or of construction, should be abstractedly and in themselves *new*, (that is, previously unknown); because such a requirement would involve an utter impossibility. Neither is it necessary, that, in reference to any occasional, minor, or partial, purpose of Architecture or of Building, they should never have previously been employed. All that is required to constitute "*a new system of Architecture, is, that its principles of design and of construction be distinct and dis-similar from those uniformly applied to these purposes, (provided, of course, that they be capable of being applied to the production of "the beautiful," and to serve the*

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*necessary purposes of the art); and that, in relation to systematic and previously established Architecture,—they be new in application,—new in combination,—and, as a necessary consequence, new in effect or in result.*



## CONSTITUENT MATERIALS

### CHAPTER II.

#### OF THE CONSTITUENT MATERIALS FOR A NEW ARCHITECTURE.

It has already been remarked, that all the styles of Architecture commonly practised throughout Europe are based upon the properties of *the same material*. Whether it be Egyptian, Greek, Roman, the several varieties denominated Romanesque, or Italian,—whether Norman, Gothic, or Elizabethan,—they equally have recourse to *stone* as their legitimate material. For, notwithstanding that in either of these styles *brick* is occasionally employed for economy or convenience, and timber, to accomplish some partial result; yet, without the interposition of *stone*, or of some composition in imitation of it, *in none* of them can any uniform architectural beauty or effect be obtained.

Seeing, then, that this *one* material forms the constructive constituent of all the most excellent and approved styles of Architecture, both of ancient and modern practice,—and viewing further the innumerable attempts to produce originality in effect, which from age to age, and by all the

most enlightened nations, have been continually essayed, in all and each of them,—we shall be almost led to conclude, that to produce in the material of *stone*, any really new and uniformly distinct species of architectural effect, is beyond the power of man to accomplish; or, at least, we may venture to assert, that it is altogether *impossible* to produce, in a satisfactory manner, any effect in *stone*, so *distinct* and so *dissimilar* from those of other Architectures, as it would be *perfectly possible to attain*, was a material (or series of materials) possessing different properties and more enlarged capabilities to be adopted.

And here it may be asked—Does not Nature afford us any material of such a character? Nature, which is so abundant in her offerings for the supply, not only of our grosser necessities, but for the delight of the senses, and the occupation of the mind. Can she—does she not, out of her infinite resources, furnish us with anything but *stone* for Architecture? Has Science, has human ingenuity, which has already accomplished so much, and is daily occupied in the task of rendering the elements of nature, subservient to the innumerable requirements of a state of society rapidly advancing in civilization and refinement,—*have these been so dormant in respect to art*, as to leave us in England, in the nineteenth century, with no other material adapted to the *uniform* purposes of Architecture, than that employed by the Egyptians and the Greeks, and by nations even more remote in the scale of antiquity,—at a

period when Britain was unknown, and her people were barbarians ?

But such is *not* the case. We possess in our own country, and in this very day, an abundance of available materials, sufficient for all the purposes, whether as regards effect or utility, of “A FUNDAMENTALLY NEW ARCHITECTURE.” It need scarcely be added, that the materials referred to are *metals*, in almost every form and method of preparation, in which modern science and manufactures have presented them.

The eligibility of that, which from its abundance must necessarily be most largely employed, viz. *iron*, has already been fully tested and proved, by experience derived from wide-spread application. Bridges on the most extensive scale, whether on the principle of *the arch* or on that of *suspension*, have long been constructed in this material, and are found to answer the most sanguine expectations of their projectors. Lighthouses of considerable altitude, and extensive buildings for gas, and other manufactories for the stowage of merchandize, and occasionally for dwelling, have been, and still are frequently erected within these dominions, and *exported* from thence to the East and West Indies, as well as to the continents of Europe and America; being found to answer every purpose for which they were originally intended, in addition to those advantages which first recommended them for adoption, viz. *cheapness* and *durability*. “The wooden walls of old England,” so long the

boast of every Briton, are daily giving place to those of *metal*. We have iron ships, (and what are they but houses, only floating instead of stationary,) to traverse the ocean, for the pursuits of commerce and the art of war. We have iron roads, to travel on by land. We have iron pipes, for the conveyance of water, and for the supply of gas, throughout our cities. We have iron erections, of various kinds, at our railroad stations. We have iron roofs to our works of Architecture; and they are found the best. We have iron rafters for floorings, iron staircases, iron door and window frames; and for all these and similar purposes, it is proved to be better than timber, for it is more durable, and will not burn. Nay, for the sake of cheapness and durability alone, we have *iron* condemned to do the duty and become a substitute for stone, in the Architecture of our streets and palaces; and, therefore, there can be no reason in the world why we should not avail ourselves of *the distinctive properties* it possesses, for the production of *a new and peculiar species of beauty* in systematic architectural effect.

The uniformly dark and heavy color of this material in its native state, presents, however, an objection to the employment of iron as the *exclusive* material of Architecture; unless the application of variously colored paints be admitted, which would necessarily detract from the legitimacy of its effects. For example: if we profess to found an Architecture on the properties of iron, we should be content

with exhibiting the effect or appearance of iron alone, in like manner as that of stone in masonry. But fortunately, we are possessed of numerous other available and analagous bodies, having properties in common with those of iron, but presenting various effects of color and resplendency unafforded by this material.

If, therefore, instead of *limiting* our endeavours to the production of "*a cast-iron Architecture*," (the desirability and want of which, has frequently been urged by modern writers upon art,) we increase the number of our appliances, so as to embrace *the whole range of metallic substances*, and admit the adaptation of all and each of them, in every form and method of preparation, in which science and manufactures, may render them available for the respective purposes of such an art,—we may attain, not only the legitimate and consistent effects of "*a metallurgic Architecture*," but also, (as will shortly be proved) be enabled to realize thereby a *higher order of beauty* than it is possible to produce in the material of *stone*, to unite in the highest degree with that beauty all the necessary "utilities" required of the art; and this, under many circumstances, at a cost far inferior to that by which the ordinary effects of masonic Architecture are obtained.

Previous, however, to entering upon the immediate consideration of "the principles of design and construction" requisite for the accomplishment of these ends, it may be desirable, briefly at least, to refer to the general capabilities

and efficiency of the proposed constituent materials of the art, in order to show their general applicability to its purposes.

In reference to the primary constituent of our art, *cast-iron*, we have abundant proof of its possessing all the requirements of strength and durability. The greatest disparagement attending it, is its oxidation; but various means already exist of counteracting its effects, (and at very trifling cost,) the most important of which is, doubtless, the comparative recently discovered process of electro-coating with copper and zinc, which (if properly applied) not only answers the purpose of preservation more permanently and effectually than other applications; but offers the additional advantage, in an artistic point of view, of imparting to iron, (or, indeed, to any occasionally more convenient substitute for that material) all the superiority of color and effect possessed by pure copper and zinc, and this at a cost little exceeding that of a few coats of common paint.

The application, also, as a coating for *iron*, of the metal *barium*, or *carbonate of barytes*, has already proved highly successful in several departments of the mechanical arts; being found to withstand the effects of heat, cold, moisture, and atmospheric agency. The advantages of such an introduction into the uses of Architecture are peculiarly important; inasmuch as it is susceptible of the permanent retention of every variety of color, and produces all the appearance of *porcelain* on the surface of the iron, present-



ing exceeding richness in effect,—and possessing the additional recommendation of the most perfect and enduring cleanliness,—a very important consideration, especially in the Architecture of cities. This, also, may be applied with sufficient economy to warrant its application to the purposes of “a Metallurgic Architecture;” and the propriety of its introduction into such an art is unquestionable, inasmuch as it is in itself a metallic substance.

An uniform and consistent application of *metals* to the purposes of Architecture will, perhaps, more than anything that could be devised, encourage the revival of the beautiful art in “wrought iron work,” which was formerly carried to such great perfection; but, unfortunately, within the last century has been greatly on the decline, and now, indeed, owing to the few opportunities presented for its introduction into works of classic architecture, may almost be pronounced extinct. The degree of excellence, however, to which every description of casting is carried, and the infinitely greater economy attendant upon it, will doubtless render very limited the employment of wrought work in a Metallic Architecture; unless it be as a partial and superior adjunct, occupying a similar position in relation thereto as does the art of Sculpture in relation to the masonic arts.

Independent of that of *casting*, various other processes in the manufacture of metals, will, whether in regard to effect, utility, or other advantages in economy, be found highly useful for many of the purposes of Architecture. Amongst

these may be enumerated, the rolling and corregating of sheet metal, and which may with great economy and convenience, be applied to various internal purposes; as also, that of stamping or embossing of the same, in the various forms required for the decorative features of the art, whenever the processes of working or casting may prove too difficult or expensive to be obtained. Every description, likewise, of woven or wire work, whether in the form of gauze, for a lining of certain parts, and for the purpose of ventilation,—for the admission, or for subduing the effects of light, force of the sun's rays, etc.—or in any other form (and they are multitudinous) in which it may be worked by the hand, and employed for the features of the art.

Copper, and more especially *brass*, will also be found a highly useful constituent of Architecture, in conjunction with iron. The facility and beauty with which every variety of form (having likewise the effect of substance) may be produced by means of embossing, as well as of casting, in this metal, and the advantages it possesses of assuming (and when lacquered, of *permanently retaining*) a similar richness of color and polish to that of gold,—together with the cheapness of its production, will render its *extensive introduction into the interior of edifices*, an object highly desirable, whenever the practice of "a legitimate metallurgic Architecture" shall become established.

Japanning, enameling, in various colors, etc., whilst forming an excellent preservative, is also a familiar append-

## CONSTITUENT MATERIALS

age of metallic substances in manufacture, and is therefore consistently admissible for the internal purposes of such an art. In fact, almost every description of paint, as also the majority of colors, being composed of metallic substances, are therefore amongst the legitimate materials of a "metallurgic Architecture." The occasional introduction of variously cut and colored glass, after the manner of gems in jewellery, is also, by reason of association, perfectly admissible into this art, whenever superior richness or resplendency of effect shall authorize it.

Following, however, the example furnished by the universal practice of the masonic arts, a "metallurgic Architecture" equally avails itself of various other bodies, as appropriate substitutes for its legitimate materials. These will also consist of brick, bitumen, compositions, cements, papier-machè, and manufactured substances of various kinds.

In reference to the use of *timber*, as a desirable and convenient adjunct for floorings, basements, and various other internal purposes, for which it is continually employed in the masonic arts,—it may be remarked, that wood, having, both in external appearance and in its general capabilities, greater affinity with metallic properties than with those of stone, is therefore equally, if not more extensively admissible in application to the purposes of this Architecture, than to those of the preceding; it being, of course, in both cases necessary to employ the same in harmony with the general design of an entire work.

FOR "A NEW ARCHITECTURE."

On account of their greater affinity with metallic properties, as well as greater warmth and dryness, in addition to superior harmony in effect, a preference will naturally be given to vitreous and similar substances, for the purposes of *pavements*, etc.; amongst the most useful of which, the numerous descriptions of encaustic and other tiles, asphaltic and other compositions, may be enumerated.

## GENERAL CHARACTER

### CHAPTER III.

#### OF THE GENERAL CHARACTER OF ITS FORMS.

Having selected for the constituent materials of our art, a series of substances of an altogether different nature, and possessing more widely extended capabilities, than the original and legitimate constituents of the pre-existent arts, —we find ourselves in possession of the means of realizing, that first and most essential concomitant of “a new Architecture,” namely, the uniform and systematic introduction of *an order of forms*, of a totally different description from those previously produced in these arts; and, consequently, for the production of all the different effects occasioned by the peculiar combinations of the same. An examination, therefore, into the abstract and distinctive character of *the forms*, which the respective productions of stone and metal afford facility for the embodiment, will, doubtless, be now desirable, in order to assist the determination of the definite and general nature of the forms and contours requisite for the fulfilment of the legitimate intentions of art, in its

application of the properties of metallic substances to the purposes of Architecture.

Stone (and also marble; for, with the exception of superiority in color and texture, the qualities of each are synonymous) being an inflexible and brittle substance, capable only of being reduced into definite regularity of configuration, by means of sawing, chiseling, friction, and the like, can only be employed in the embodiment of forms of a heavy and massive character. These must necessarily be limited to those of geometrical science, or to the representation of such objects of nature, or forms deriveable from nature, as are of considerable bulk or substance.

The only manner in which forms of slender and delicate proportions, can with any regard to durability be executed in stone, is by carving them *in relief* on the surface of a block (as practised in all the masonic Architectures) a style of execution perfectly consistent with the nature of the material,—but incompatible with the *perfect* representation of any given object; inasmuch, as it must of necessity be made to appear as if growing out of, and therefore forming part of the block itself.

The character of metallic bodies, on the contrary, being flexible and tenacious, capable of compression, distention, and, by reduction into a fluid state, of being cast into an endless variety of moulds,—affords facility, not only for the illustration of problems and the embodiment of combinations of geometrical forms, which are impossible of accomplish-

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ment in stone, and consequently in all pre-existent Architecture; but also for the embodiment or substantial representation, in a detached and perfect state, of almost every object or form within the whole range of *natural* product, and of poetic fancy, to a degree of minuteness and delicacy far beyond the legitimate requirements of Architecture, or even of *genuine art* itself.

Metals, then, as will be found, afford facility for the substantial embodiment of the greatest possible variety of forms; and it is a singular coincidence in relation to art, and one which, *if iron continues to be employed in Architecture*, loudly calls for a new system of design,—that the definite and regular forms best suited to the nature of stone, as being most easy of accomplishment, *viz.* those of simple geometrical science, are the class of forms most difficult of production in metal; and especially unfavorable in reference to the accuracy of *combination*, and undeviating exactitude of relationship to each other, which the distinctive parts of an Architecture, composed of such description of forms, are required to bear. For example,—a regular cube is one of the most easy figures to produce in *stone*, being merely required to be sawed out of a block; but a regular cube is one of the most difficult figures to produce in *metal*, whether by the process of casting, or by hand labor; for, in either case, the variation it undergoes in the process of cooling, will usually cause it to be in some degree warped or drawn out of the exactly intended form, inde-



pendent of the natural contraction and expansion of the metal, which ever afterwards takes place, on the variations of the atmosphere. The difficulty, moreover, of producing with such elements, the continuity of perfectly *level lines*, whether perpendicular or horizontal, required in the numerous mouldings, and other parts and features of masonic Architecture,—proves, the successful combination of such forms, when produced in metal,—a task demanding, perhaps, greater skill and patience for its accomplishment, than that attending the production of the individual forms themselves.

But “the forms” developed in the various objects of nature, being usually composed of *curved* rather than *straight* lines, requiring less exactitude in casting or other preparation, depending less *upon*, and presenting less difficulty in fitting, and being also less *visibly affected* by the subsequent variations of the atmosphere, are unquestionably most coincident with the nature and properties of metallic bodies; and are therefore (with all the combinations of which they are susceptible) adopted for the purposes of this system of Architecture; in conjunction with the *detached or perforated style of execution*, (so far as the same shall be found consistent with beauty and utility) as being also most expressive of the characteristics of its constituent materials.

“The forms” exhibited in the productions of *nature* are here alluded to, in contradistinction to those of *geometrical*



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*science*. Not that the former are *unscientific*,—for they exhibit the developement of the highest order of science; but because it is *nature* that best instructs us in the combinations of these forms, for the production of the most perfect beauty, in conjunction with the highest and wisest of *utilities*, and in so doing becomes the handmaid, or rather the director and controller of science, in the production of art.

It is *not*, as will be seen, from any *capricious preference* to forms deriveable from general nature over those of positive geometrical science, that these are selected for the purposes of a practical architecture; or simply from a desire to depart from the forms, or the methods of expressing the forms, employed in pre-existent Architecture, merely for the sake of novelty; or even for the production of that higher and more varied order of beauty, (in conjunction with all the necessary utilities of the building art) which is fully capable of being realized in an Architecture composed of such description of forms; (though this alone were amply sufficient reason to justify their adoption); but from their being *best* adapted to the properties and capabilities of metals, and therefore *best* adapted to the purposes of “a metallurgic Architecture.”

The object, however, in view, is to establish a system of Architecture, which, while providing for the fulfilment of the just intention of the art in general, by the combination of beauty with utility, shall at the same time be integrally

*dissimilar* from all known and commonly practised systems, in *design*, in *construction*, and consequently in *effect*. And on examining into the general character of the forms best suited to the properties of metals, and also into the indispensable concomitants of “a new system of Architecture,” the nature and capabilities of the one will be found perfectly synonymous and coincident with the requirements of the other. Forms, and methods of execution, different from those previously employed for such purposes, are amongst the inevitable requirements of “an integrally new Architecture;” and it is such forms, and such methods of execution, that the properties of metals, under the direction of art, are best able to supply.

It now, however, remains to be considered, how and in what manner are the *forms* exhibited in the productions of nature, and all modifications of the same, to be adapted to the practical purposes of Architecture.

In reference to the accomplishment of *the beautiful*, in the combinations of forms and lines, some highly useful lessons may be derived from nature herself, particularly in the Architecture of *man*, in which, while the *rounded* or *undulating* line is generally found to prevail, the effects of the various combinations of these are relieved by the occasional and partial introduction of the *straight line*; and this is found to occur in those parts usually esteemed the most beautiful,—as for example, the *nose*, the *junction of the lips*, *teeth*, etc., exhibit *straight lines*, while all the re-

maining forms and contours of the human head are composed of *curved lines*.

In the composition of *flowers*, also, the *curved line* is most predominant; but is counterbalanced by the introduction of the *straight line* in the stamina and stem. In fact, the same law is found to prevail throughout organic nature in general.

Following the analogies of nature, therefore, in the application of her forms to the purposes of Architecture, it will be found, that the general preponderance of the *curved* over the *straight line*, is not only perfectly coincident with, but (provided the adaptation be conducted with requisite artistic skill) is also inseparable from, the production of the highest order of beauty.

The relations of these *forms* to the necessary *utilities* of Architecture, have now to be considered; and in this view also, the general preponderance of the *curved* or *undulating line* over the *straight line*, may equally be brought to prevail, without any sacrifice whatever of the various utilities and conveniences its productions are required to serve; and indeed, in very many instances, with considerable advantage in these respects. For example,—a most desirable result in buildings, (whether public or private) is, that they should be *cleanly*; and if due regard was paid to this in constructions, the junction of right angles, (or, at least, the preservation of the acute points of such angles) would be as carefully avoided, as they are now almost unboundedly

introduced. For, whether in the corners of stairs, the floors, or ceilings of apartments, the panellings of doors, etc., or the frames and sashes of windows, they answer to no real utility; but on the contrary, form receptacles for troublesome insects, etc., and accumulations of dirt, which baffles the endeavours of the domestic thoroughly to eradicate.

On many occasions, it is true, straight and level lines are indispensable,—as, for instance, in the floor, and perpendicularly or partially so in the walls; but no necessity exists for direct right angles in apartments, except at the junction of the floor and walls; and then, indeed, domestic convenience and economy would dictate the gentle rounding of the acute point of the angle, as is almost invariably observed in the economy of nature. In but one or two instances, therefore, is there any necessity for level lines in apartments; and in scarcely a single instance is any utility to be derived from the junction of *right angles*.

In respect, then, to the various utilities in building, this art is at once free to follow the example furnished by her unerring prototype, *nature*, in the production of *the beautiful*, by means of the preponderance of the *curved* over the *straight line* in her forms and constructions.

The universal law of the preponderance of the *curved* over the *straight line*, manifested in the productions of organic nature, being adopted in the arrangement of the *primary parts and masses of this art*, the preservation of

consistency and propriety, and the consequent production of unity in its effects, imperatively demands, that the same principle shall be followed up in relation to all the extraneous, or more decorative parts and features, of its several productions; and the unlimited capabilities of metallic bodies for the fulfilment of these intentions, renders the adaptation of the forms exhibited in the productions of the whole range of organic nature, to these several and respective purposes of the art, an object equally felicitous in the accomplishment, as it is conducive to unity, originality, consistency, and peculiar interest and beauty, in its general effects.

The extraordinary strength and tenacity possessed by these bodies, and the fulfilment of the just intentions of art, in its application of these properties to the purposes of Architecture, will necessarily require the introduction of *perforated work*, in the various parts and features of the art to which it is applicable; the same being in strict conformity with the economy of metallic manufacture, and by no means contradictory to the requisite utilities of the art.

The employment of these substances in solid masses, is most uneconomical and useless, for any constructive purpose; and when applied as a substitute for such—for example, as columns in buildings, they are invariably hollow tubes; and even then, are not required to possess anything like the bulk, indispensable in stone, for ensuring an equal amount of strength. While, therefore, a due regard to

economy, and conformity to the properties of the material, require objects of such a nature to be hollow—Art demands the manifestation of this fact and property, and the adaptation thereof, to the production of “the beautiful.”

The most artistic and consistent method, therefore, to be pursued in the application of bodies of such a nature, to any purposes of constructive art in architecture, is not to disguise or conceal the qualities of which they are innately possessed, by making objects assume an appearance of solidity, which in fact are hollow (unless the faithful representation of any natural production shall demand it)—but by honestly exhibiting the nature of the substance of which it is composed, in the perforated, light, and flowing style of design and execution, for which they are so eminently applicable.

It has previously been remarked, that “the carved” or *basso relievo* style of execution, or any imitation thereof, is a peculiar and necessary consequence of the nature of stone, in its application to the purposes of Architecture; and that it is as equally *inapplicable* to, and *inexpressive* of, the different properties, and more enlarged capabilities of metals. The facilities presented by these bodies, for the substantial and durable embodiment of “perfect forms” of the most delicate proportions, altogether does away with the necessity of subjecting forms, of this description, to the conventional restraints of representing them as forming part of a block or solid, on the surface of which they are carved

or moulded ; and the greater boldness and freedom attending the detached and isolated style of execution, and the infinitely greater amount of cleanliness, consequent upon its application to the purposes of building, forms sufficient reason for the total *rejection* of the *former*, and *substitution* of the *latter*, in the arrangements of this Architecture—for which also provision is effectually made in the application of the peculiar constructive principle of the art—the nature and effects of which will be explained in the succeeding chapters.

It will now be necessary to consider the limitations and modifications under which the forms exhibited in organic nature are to be introduced, and the conventions requisite to be observed in the adaptation thereof to the Art in question.

In the embodiment or representation of all human or ideal forms, the principles of the art of Sculpture must inevitably be observed ; and especially those principles of the art which affect the convention of the various descriptions of *alto*, *mezzo*, and *basso rilievo*, and which, when applied to metallic productions, become fully coincident with their nature and properties, in the circumstance of the omission of an attached ground, or plane surface, to the objects or figures represented.

In the embodiment or representation of all other natural productions, whether of the animal, vegetable, marine, or mineral kingdoms, a free imitation of the forms of nature,



in the object represented, will be required ; subject, of course, to those principles of Sculpture previously referred to and elucidated in the several conventions of the *relievo* style of execution, and which may be defined as *the laws* by which the compression or flattening, in various degrees, *the forms and actions* of the objects represented, are governed. And, also, in peculiar reference to the production of the respective parts of *this Architecture*, *synonymous*, although *contradistinguished* rules, will be necessary to be observed, and which relate to the thickening or distention of the substance of any object, whenever its natural proportions shall be found incompatible with the just requirements of art in Architecture, and exemplified in the combination of beauty with utility.

At the same time—that the principles of this art, require the free imitation of the forms of natural objects, it does not of course require, that the precise aspect they present, or manner in which they are exhibited to view in living nature, is at all times to be adhered to:—For example ; by the application of the skill of the gardener, the productions of the vegetable and floral kingdoms, may be trained and constrained into a vast variety of forms, which, although extremely different from, and it may be, the very reverse of those, which they would naturally present, are by no means incompatible with their growth. Such constraints, or other ideal variations from native habit, or from the combinations of nature, are therefore not only perfectly al-



lowable, but highly essential in this art—as also the choice of representing such objects after separation from their parent stem ; as for instance, in wreaths composed of various fruits and flowers.

In the combination of forms, not representative of the productions of nature, and the application of the same to the extraneous or decorative features of this art—consistency and uniformity with the forms and contours of the integral masses, and the preservation of harmony in the general effects of the art, will (while fully admitting the application of geometric science in the *arrangement* of these forms and combinations) require the *preponderance of the CURVED* over the straight line, in accordance with the analogies of nature, upon which this art is founded, and the fulfilment of the just intentions of an Architecture—*dis-similar* from all others, in the character of the beauty, in conjunction with the peculiar utilities it has the power to produce.

An inevitable consequence of the practical application of “these principles,” and one by means of which, the primary intentions of this art can alone be fulfilled, is, that “*an entire independence*” of the several members, parts, or features of pre-existent Architectures must at all times be maintained. It is not by this to be inferred, that *all* such *primary* forms, as may be found in masonic Architecture, are to be rejected ; because this would arbitrarily exclude from this art a vast variety of combinations and modifications

of the arch, a feature most peculiarly coincident with the general character of its forms and outlines. But the rejection of the *precise manner*, in which such forms are expressed, is inevitable; because the general character of the decorative constituents of this art,—the preponderance of the *curved* over the straight line in *detail* as well as *en masse*,—the *rejection* of the carved or *basso relievo* style of execution,—and the substitution of forms originally *isolated* and *detached* from the primary masses,—will render impossible the imitation of the precise forms and effects of any application of the arch in masonic Architecture.

Again, the cylindrical form is adapted to the purposes of *a column in masonry*,—and such form is by no means inconsistent with *the philosophy of this art*; but, in the application thereof in accordance with these principles, an equal independence of *the manner* in which such form is expressed, and the effects produced by it, is inevitable.

A further and necessary consequence of the established independence of *the forms* exhibited in *the members or parts* of pre-existent Architecture, is, *an entire independence* of those several members themselves. For example, a *column* which, upon classic principle, is composed of the separate members of *base*, *shaft*, and *capital*, or an entablature, having those of *architrave*, *frieze*, and *cornice*, denoted by distinct lines of demarcation,—may each, in any synonymous features in this art, be composed of one, two, or more members; according as the particular character or circumstances

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of a design shall require, and the realization of beauty and peculiarity in effect may demand; a similar rule or example will equally hold in reference to all other members or parts of every known style of Architecture.

In thus establishing an independence of the *members*, as well as the *forms*, of "pre-existent Architecture," an entire independence of *arrangement*, in relation to these constituents generally, (and by which *form* is affected, in reference to any given work, as a whole,) is also of necessity to be inferred. And, when the general nature of the forms of this Architecture are taken into account, the utility and advantage of this maintenance of independence will also in this respect become manifest.

Nevertheless, the subtle and peculiar nature of *this*, as well as every other species of fine art, renders it impossible to exhibit *the particular laws, rules, or methods*, by which the combinations and arrangements of *forms* are to be affected; except in the several productions of the art itself.

## CHAPTER IV.

### OF THE "CONSTRUCTIVE PRINCIPLE,"—ITS ECONOMY AND EFFECTS.

The adaptation to the purposes of *practical Architecture*, of the forms and combinations referred to in the preceding chapter, and a due regard to the nature and economy of the materials, adopted as the genuine constituent of this art, will render inevitable the application of *principles of construction* altogether dissimilar to those of *the masonic arts*.

Now, *the principles of construction* in Architecture, necessarily influence the character of its design; and therefore, the only sound and satisfactory method of proceeding in the present instance, is to consider *metal* as occupying the same place in this art, as does the material of *stone* in the masonic Architectures,—that is, as *the sole constituent*, doing the entire work of the art. And while claiming for "metallurgic Architecture," the privilege which is universally admitted in the practices of its *elder prototypes*, viz. that of employing *other* materials as substitutes for its legitimate constituent, according as convenience or circum-

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stances shall dictate,—it is only by adapting our *constructive principles* to the economy of *metals*, that we shall be enabled to arrive at the *uniform, comprehensive, and consistent effects* of “an Architecture, which, being dependent for its ulterior results, upon forms and combinations adapted to the nature of *metals*, ought therefore to be *integrally based* upon the properties of those bodies.

In the practice of this Architecture, there will, of course, be no more *necessity* for the employment of *iron* in the construction of the walls of edifices, than there is for the use of *stone* for the like purposes in the other Architectures; brick, bitumen, and various species of cement, being equally available as substitutes for either. But while (in the practices of pre-existent Architecture) *cemented walls* are required to be cut or marked out in straight lines, to represent the effects of blocks of stone in masonry; so likewise whenever similar substances are made use of in *this art*, it will be equally necessary to employ them in such manner, as that *they* also shall represent the external effects of a *principle of construction* consistent with the forms and general purposes of this art, and adapted to the native properties of *iron*. With this premise, therefore, we proceed to the consideration of “*constructive principle*.”

“The increased amount of strength and tenacity possessed by *iron*, renders its employment in *solid masses*, similar to the blocks of stone in masonry, utterly useless. And, therefore, in all mural erections, the reasonable

economy of material and of weight, will dictate the adoption of *iron scantling* or *tie bars*, covered on either side with *plates* of the same material, and of moderate thickness, as a sufficient and *consistent* substitute. These *plates*, however, will require to be attached to the scantling, and connected firmly together, by means of *pins* or *rivets*, which pins, for convenience and security, will be required to pass *through* the plates, and develop themselves on the external surface; thereby affording occasion for the introduction of an *ornamental head* or termination to the pin; by the judicious *combination* and *arrangement* of which, a singular beauty in effect may be obtained,—and a beauty, moreover, *conformable with the most rigid rules of Architectural criticism*, inasmuch as it unquestionably “issues out of use.”

In the regulation of “the forms” of these plates, the general rule laid down in the preceding chapter, namely, that of the preponderance of the *curved* over the straight line, will be requisite to be observed, in order to the due attainment of harmonious effect, with the general forms of “the primary masses,” and decorative features of the *Architecture*, and of coincidence with the natural and manipulative economy of metals.

The precise manner in which the junction of these plates is accomplished, is referable to the judgment and discretion of the architect; the objects therein to be attained, are, the exclusion of water and air from the interior, and due allow-

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ance for the contraction and expansion of the metal, consequent upon the natural variations of heat.

“ *Uniformity* of “ constructive principle ” is however essential in Architecture ; and therefore, as “ pins or rivets ” are (from the nature of the materials) requisite to be employed in the erection of the *walls* of an edifice, so also will *similar* means be applicable in the erection of the various other parts and features of which it is composed. Such an arrangement being in perfect accordance with the manipulative economy of this art ; inasmuch as the general character of its forms, and the production of its peculiar effects, *necessarily requires*, that the prominent or decorative constituents should be *cast in a separate mould*, or otherwise prepared distinct and separate from the *metallic plates* forming the outer portion of the wall.

“ The consistency and convenience of this method of construction, is rendered further obvious, from the circumstance of its affording ample facility for the introduction of *a coating to the iron plate*,\* presenting the CONTRAST of color between the *level wall*, and its *projective features*, which the just exhibition of *the beauty of perforated work* requires.”

The latter object might be attained, by affixing the piece of perforated work *closely* over the plate or wall, thus exhibiting the contrasted color. To such a method, however, there exists very serious objections : first, it would, by placing an undue *restraint* upon the *forms*, greatly interfere with that indispensable “ *projection of feature*,” which the



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general laws of Architecture imperatively demand; and, secondly, it would occasion an accumulation of *dirt* in the interstices, by which the design would become *clogged*, and its beauty impaired. But, if by a simple extension of the *length* of the *pin*, these chased or perforated features are sustained at a short distance in advance of the plate or wall; a free passage for dust and water will be secured between the surfaces, by which the beauty of the features, and the general *cleanliness* of the entire structure, will be most effectually preserved,—a greater boldness and freedom in projection attained,—and *above all*, the additional beauty of the *optical illusion* or *protean effect*, peculiar to this Architecture, and occasioned by the projection of the “*shadows*” of its features, is produced.

The character of the *foundations* of edifices, involving considerations of utility alone, does not necessarily form part of “a peculiar system of Architecture. While, therefore, the qualities of metals afford opportunity for the introduction of various methods of constructing foundations, occupying the least possible amount of underground space, absorbing the least possible amount of moisture, and therefore preserving a greater dryness and purity of air in these regions,—the ordinary means and materials employed for these purposes, in the case of other Architectures, are equally available in this.

In the construction of *roofs*, whether upon the ordinary principles employed in Architecture, (and for which *iron*



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is so extensively used,) or upon that which is exclusively applicable to the nature of metals, viz. the principle of *suspension*,—opportunity is afforded for the introduction of every variety of form which can well be imagined or desired, either in respect to utility, or of adaptation to artistic beauty in effect. The application of the latter principle will be found to facilitate the construction of roofs of greater extent than can usually be accomplished, without the intervention of columns, arcades, or other means of support, occupying considerable space in the interior of an edifice; and could more easily be brought to harmonize with the general effects and intentions of this art, than with those of any of the masonic Architectures.

Any principle of “metallic construction” that can be applied to roofs, must necessarily be synonymous with that upon which this Architecture is based; and, so far from its becoming necessary to conceal the character of such construction, (which is frequently the case when iron is employed in masonry, *a perfect harmony in GENERAL EFFECT will prove the almost natural result of their association.*

In the completion and decoration of these roofs, it will of course be requisite to preserve an uniformity and consistency in effect with the remaining portions of an edifice; by the maintenance of the preponderance of the *curved*, over the straight line, in the general dispositions of its forms and compartments. The introduction of perforated work of various device, and exhibited on contrasted colors, may both in *inte-*

*riors* and *exteriors*, be brought to present the most singularly beautiful effects; and the general arrangements of the respective features of this Architecture, will fully admit the advantage of suspending (whether from the roof or elsewhere) “works of art,” in such positions, as shall enable the spectator to view them without pain, inconvenience, or detriment to their general effect; and this, whether they be productions of the art of Painting, that of Sculpture in metals, or any unique specimen of “metallic work.”

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The power of sustaining attached or suspended weights, possessed by metals, and the general character of the forms exemplified in the principles of design and construction upon which this art is based, will enable the Architect to *dispense with columns* in the central avenues of *porticos*, of whatever dimensions they may be.

The advantages of this peculiarity are of very considerable importance. In the practice of “masonic Architecture,” it is universally felt to be exceedingly difficult to reconcile the “fenistrated” with the “columnar” arrangement. *Windows and columns being antagonistic*,—the one intended for the admission of light into the interior, the other forming a barrier to obstruct its entrance.

In the Architecture of the Greeks, the root (if it may be so expressed) of all other classic styles, there are few, if any, examples of *windows*, or of any other mural aperture

for the admission of light. This object with them, for all public purposes, (the only purposes, be it remembered, to which they applied Architecture) was more effectually obtained, by leaving the central portion of the roof uncovered. The frequent intensity of *cold*, however, and the large amount of *rain*, to which our climate is exposed, (and which is almost unknown to the genial skies of Attica,) renders the *close* and *entire* covering of buildings indispensable; thereby creating a necessity for other means of *lighting*, (as also of ventilating and warming,) than that which had need to be employed, by these, our first and greatest schoolmasters in the art.

With the extensive use of *columns*, therefore, derived from *their* example, *we* find it necessary to combine the additional features of *windows*, with which it is tolerably clear they were never originally intended to associate. It is, however, much more easy to point to this as “a defect” in modern practice, than it would be to provide “a remedy” so long as *stone continues the SOLE PRIMARY constituent* of Architecture.

*We* cannot usually admit light into our buildings, as they did; that is *solely* from the *roof*:—and, indeed, if it were in all cases possible to do so, it would be exceedingly *unaccordant* with our natural ideas of beauty and comfort, as it necessarily excludes from interiors, the enlivening effects of landscape, or the cheerfulness of thronging streets; and would, if applied to domestic dwellings, convert them

into little better than prisons. Windows, therefore, are indispensable ; and at the same time, to us, more even than to the Greeks, the *shelter* afforded by a *portico* at an *entrance*, is highly desirable ; and for these porticos, *columns* or *piers* are, according to all *present examples*, also indispensable.

But it may be said, that “light” may be admitted at the sides, or rear of an edifice, (where colonnades are not required) without introducing these apertures at an entrance : and so it might, provided we could at all times ensure as commanding situations as those of “the Greeks.” But how different are the *usual sites* and localities of our structures,—theirs towering on an Acropolis, with a superabundance of light and space ;—ours, on level ground, and frequently in dark and narrow streets, crowded with other buildings, which prevent the introduction of sufficient light in the other parts of the edifice ; and hence arises the necessity of having recourse to the admission of these unsightly appendages behind the columns of porticos, thereby maintaining a perpetual contradiction of intention,—the *windows marring the effect* of the *colonnade*,—and the *columns obstructing the useful purposes* of the window.

By the facility, however, afforded by the application of metals for the construction of *porticos* without the intervention of columns in their central avenues, and the power attained by the “peculiar principles” of this art, of rendering constructions of such a nature, conformable and har-

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monious with its general effects,—*the desirable end will be accomplished, of removing these obstacles to the free admission of light, and RECONCILING associations of purpose,* which, in all the various modifications of “classic art,” have presented considerable difficulties in the practice of Architecture. Nevertheless, occasionally the attainment of “effect,” or of some other advantage, may fully justify the introduction of columns in the metallic portico; and these, being usually “*perforated*,” will, in the respects above referred to, be found *infinitely less objectionable* than the heavy and opaque columns of masonry.

Another advantage attendant upon the portico without columns, is its greater economy of *space*, an object likewise of considerable importance, especially in the Architecture of *cities*. The ground room usually occupied by the bases of columns, being available for the purposes of a foot and carriage way, thereby enabling the latter to set down and take up visitors, under the complete cover of the portico; and facilitating the dispersion of a crowd on its exit from a building. The same remark, namely, that of the non-obstruction or economy of space, will also apply to all similar arrangements in interiors of edifices.

Connected with the subject of the admission of “light,” it may also be desirable to remark on *another peculiarity*, consequent upon the application of “metallic manufacture” in Architecture, which is, the introduction of *transparent canopies or semi cupolas*, for the heading of windows, an-

pendages, which, *while greatly conducive to the general "beauty of effect,"* especially in the *interior* of the apartment, under the influence of *natural light*,—and of the exterior, under the influence of the same, and also of that of *artificial light* from within,—will likewise be found to embrace an important advantage, in respect of utility, in adaptation to the variable character of our own climate,—being calculated to *check* the *power* of the *sun's rays*, in their entrance into the interior of an edifice, (an object highly desirable to be accomplished at some seasons of the year,) without having the unpleasant and inconvenient effect of *excluding the natural light*, at seasons when the largest amount that can be admitted, is, perhaps, barely sufficient for the useful purposes of the building.

Iron, having already been variously and extensively applied in the erection of staircases, it is very questionable if any new and improved principles of construction for these purposes, could, or indeed had need to be introduced. That the *designs* of such will admit of infinite modification and improvement, both as regards effect and cleanliness, by an application of that principle of this art, which requires the preponderance of the *curved* over the straight line, and the general avoidance of positive right angles, is, however, unquestionable; and the advantages resulting also, from such combinations of perforated work, as are capable of being adapted to these purposes, are most considerable and important, whether as regards lightness, harmony

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and beauty in effect, or the diffusion, or non-obstruction of light, throughout these portions of an edifice.

In the erection of belfry and clock towers, for churches and other structures, the application of metals, upon the principles herein set forth, may be brought to result in the most singularly felicitous effects, combined with all the utilities such erections are required to serve.

## CHAPTER V.

### THE SAME,—CONTINUED.

The subject of "*the construction of chimneys*" is one, which unfortunately has not sufficiently attracted the attention of scientific and practical men. The prevalent annoyance of "smoky apartments," and the number of *mean and hideous contrivances* to remedy the evil, appended not only to structures of merely mechanical description, but even to a large proportion of those, bearing the character of respectable architectural productions; furnishes sufficient evidence of the general want of improvement in this department of "constructive art." There can be little doubt, that much of this is attributable to a want of acquaintance with "the natural laws" governing the effects of *combustion*; as well as to want of skill, attention, and foresight, in the construction of *flues*. Now, however, that we have become so far civilized, as to substitute the use of "machinery," for the barbarous and degrading practice of employing children for the purpose of cleansing them,—it will doubt-



less be worth enquiry,—whether *iron tubes*, inserted within the walls of houses, might not possess advantages over brick-work for chimneys; as they would certainly occupy far less space, while admitting (if requisite) a greater amount of *curvature* in arrangement; in addition to the opportunity afforded by such means, of distributing chimneys in various directions throughout the walls of a building, thereby occasioning the diffusion of a degree of warmth and dryness, without any additional expense or inconvenience.

These, however, are merely considerations of utility, not necessarily bearing upon the general questions of this art, for the purposes of which the ordinary methods of constructing chimneys are equally admissible, if found best suited to the required end. Nevertheless, in case of either application, the general character of design requisite for the fulfilment of the intentions of this art, will undoubtedly facilitate the improvement of the effect of the numerous “metallic tubes,” which custom or necessity seems, unfortunately, to have rendered almost indispensable appendages to the roofs, not only of private, but frequently of public structures.

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Upon the proper “Ventilation” of Buildings, much of the health and comfort of life, may be said to depend; and the means of its accomplishment, ought therefore to command the most careful attention. Hitherto, this object,

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(for general purposes) has been thought sufficiently attained by means of openings in the windows for the admission of *fresh air*, without any adequate provision for carrying off that which has become foul by respiration. The circumstance of perforated metal plates, or metallic gauze, being employed for these purposes, usually renders ventilators exceedingly difficult to harmonize with the general effects of masonry; a difficulty, however, which the application of the properties of metals to the general purposes of Architecture, is calculated *entirely to remove*,—inasmuch as it affords, not only greater facility for the concealment of these apparatus, but presents the most ample opportunity for converting the various necessary appendages of ventilation, into the auxiliary beauties of the art; or, at least, for the removal of the effects of that offensive obtrusion of the bare utility, so generally consequent upon their introduction into works of existent Architecture.

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The same facility of adaptation will likewise be found to apply to the various processes of Warming, by the trans-~~fusion~~ fusion of heated air, etc., as well as to the Artificial Lighting of buildings. Lamps, sconces, gas fittings, etc., being necessarily composed of metal, may evidently, with greater regard to consistency and uniformity in design, be distributed throughout, and made conducive to the general

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excellency of effect, in the case of productions of the metallurgic, than can possibly be brought to prevail in those of the masonic Architectures.

One of the most important considerations in the erection of dwellings, and similar edifices, and by which comfort and health are materially affected; is the requirement, that structures of this nature should have the effect of keeping off the heats of summer, and the colds of winter; and the question here naturally suggests itself,—whether the proposed system of Architecture is calculated to embrace these necessary utilities of the art?

In respect to the former, namely, keeping off the heats of summer, or of tropical climate generally, we have proof of the general efficacy of buildings composed of *double* plates of iron; in the fact of constructions of this description being manufactured in this country expressly for exportation to our southern colonies; where they are found to answer the required end far better than any other description of buildings. But equally, if not more satisfactory evidence of this fact may be adduced from the analogy furnished by our own experience, in the construction of iron safes, which if composed of *single* plates, will, when acted upon by fire, become red-hot, causing the contents to ignite and be destroyed; but, if composed of *double* plates, so that a thin stratum of air is admitted between the two, the heat is prevented from penetrating, and their contents are perfectly secure. Constructions of double iron plates,

therefore, whether for safes or houses, in accordance with the principles of this art, are calculated to prevent the admission of heat, at least to any dangerous or highly inconvenient extent.

Now, therefore, the enquiry arises,—What effect is calculated to result from the colds of winter, or of northern climate generally? We answer, heat is cold; and cold is heat: the difference is only in degree—or, in other words, either can be said to exist only in comparison with the other; and therefore, if heat will not penetrate,—cold, as it is popularly termed, will not penetrate. If walls of this construction be not susceptible of the influence of heat, they will also be not susceptible of the influence of cold, but will maintain a tolerably equable temperature.

The ordinary variations of the atmosphere, nevertheless, affect to a limited extent the condition of cast-iron, as well as other metals; but this has reference more particularly to the elasticity of these bodies, or, what is termed their tension, or degrees of density; for which provision is required to be made, in all constructions for which they are adopted.

In providing for this natural contraction and expansion of metal, in the construction of houses, it might, by the uninitiated, be thought to necessarily occasion an inconvenient admission of air into the interior; but the fact of this objection being effectually overcome in the case of the application of iron for ship-building, and in the erection of gas

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houses, etc.,—is a sufficient proof of our possession of requisite knowledge, and mechanical appliances for the the successful counteraction of these, and all similar effects.

Another important inference is also deducible from the above facts, relating to the non-admission of heat in structures of this nature; which is, that while heat will not penetrate from without, neither will it penetrate, or evaporate from within—unless apertures be opened for the purpose; and consequently, such buildings become condensers of heat, economising to the greatest possible extent the fuel necessarily consumed for the purposes of warmth and dryness; of which a smaller amount is required in the case of iron houses, from the fact of this material being non-absorbent of moisture, and consequently far more impervious to damp, than either stone, brick, wood, or any other building material; in addition to the increased advantages in reference to health and comfort, and the uniform beauty resulting from the apparent effects of uniform dryness.

The above facts, it is scarcely necessary to add, furnish also abundant evidence of the non-combustion of edifices of this nature, or of their being, in the fullest sense of the expression, *fire-proof*.

In reference to the effects of *Electricity*, a peculiar advantage, in respect of safety, attaches to constructions in this material; inasmuch as they are natural conductors, and consequently not liable to the injury and destruction to

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which bodies of different natures are liable on exposure to such phenomena.

The exceeding unfrequency of serious *earthquakes* in our own climate, render considerations in respect thereof comparatively unimportant; unless in a commercial point of view, or in relation to the condition of our colonies. There can, however, be no question, that structures of this nature possess more safety, in the case of such convulsions, than those of any other character; and the following extract from recent public journals, is (amongst numerous other evidence) interesting, as furnishing proof of experience on the subject.

“The late frightful earthquakes in the West Indies, by which the brick and stone buildings of whole towns have been levelled with the ground, and the wooden ones consumed by the fires, which usually burst out after the overthrow of the other buildings,—have drawn the attention of many persons, residing in districts subject to these awful visitations, to the advantage of houses constructed of iron, which have been found *to stand the shocks of the severest earthquakes uninjured*; and which are, of course, proof against such conflagrations, as that which swept away at Point à Pitre, in Guadaloupe, all that the earthquake had spared.”

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After all the evidence, however, that can be adduced in favour of the erection of houses and other buildings of cast

iron, the interesting and important fact yet remains—that England, and the world, are now in possession of the means, by which a new and entirely *dissimilar*, and a more beautiful Architecture may be realized and established, without any *necessity* for employing for all primary purposes, any other than her ordinary and long tried materials, brick and stone:—nearly every advantage, in the majority of structures, in respect of *peculiar beauty in effect*; nearly every advantage in respect to superior *cleanliness*, being perfectly capable of attainment in this Architecture, though the walls and primary masses be of brick and bitumen, or any description of cement; and nearly every utility and convenience, resulting from peculiarity in primal form and feature, may be efficiently accomplished, without any further introduction of metal into such brick work, than is frequently employed in the practices of existent Architecture. And while, for the exterior of edifices, a comparatively small amount of metal, is all, that is of necessity required, for the production of the peculiar and original effects, combined with the requisite utilities of the art,—nearly every singularly beautiful effect may be satisfactorily attained in interior arrangements, without (if need be) any other employment of metal, than that for gilding, colouring, etc., or the occasional strengthening of parts.

The Art, therefore, although founded on the properties of *material*, is to a great extent independent of material,

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and retains its own integrity, irrespective of the various contingencies attendant upon the application of the properties of those very bodies, upon which its principles are based.



## CHAPTER VI.

### OF THE NATURE OF THE ART ITSELF.

Having considered the general nature of the principles upon which the Architecture in question is proposed to be based, and pointed out some of the advantages attendant upon, or which may be expected to result from their practical application; it will now be requisite to make some observations on *the nature of the art itself*, and the peculiarities necessarily attendant upon its study and practice.

The first intention of a new system of Architecture is, or ought to be, the production, not only of effects of *dissimilar* character, but of a higher order of beauty, than is capable of being exhibited by any application of the principles of pre-existent art.

Now, if it be admitted, that the forms of nature in general are more beautiful than those of geometrical science, it follows as a necessary consequence; that, if the principles of this art, in relation to the application of these forms, be adhered to, and the just intentions thereof be fulfilled in

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the production of the beautiful,—that the beauty so produced will not only be dissimilar from, but will partake of a higher character than that which is occasioned by the exhibition of geometrical forms and combinations, especially such as display the predominance of the straight over the curved line.

If the forms of flowers, plants, and other natural objects, and the various combinations and modifications of these forms, which it is in the power of art to affect, possess more beauty, interest, and variety, than is exhibited in the mouldings and other decorative features of masonic art,—and if the capability of metallic properties, for the illustration of geometrical problems, and for the production of varieties of form in transparent and perforated work, can be brought to exceed the capabilities of stone, in its production of massive and opaque forms,—little doubt can be entertained of the ultimate result of the legitimate application of these properties in constructive art.

If, again, by the instrumentality of art, any advantage in respect to the effect of a work of Architecture can be attained, by the harmonious combination of colors, which may legitimately and consistently be accomplished, by the judicious application and conjunction of the various constituent materials of this art, over that resulting in masonic art from the uniform color of its one legitimate material,—then, also, is the beauty which may be attained in this Architecture of a higher order than that of others.

The beauty, however, attainable in the art of Architecture, is of two-fold character, namely, *the relative*, or that which is occasioned by the combination of its respective parts; and *the positive*, or that occasioned by the nature of the parts themselves.

Now, it is perfectly evident, that if the delicate and flowing style of design (the only one, be it remembered, by which the peculiar properties of metals can be satisfactorily exhibited) be generally (and when utility admits) introduced into the productions of Architecture,—that the separate parts and features of which any given work is composed, are capable of being brought to exhibit an infinitely greater variety of *beautiful* and *perfect forms*, than it is possible to produce in any correspondent or equivalent feature, in the material of stone. The shaft of a column, for example, consisting of light and perforated work, intertwined with flowers, or other objects after nature; will necessarily exhibit a greater degree of positive beauty in itself, than any shaft of a stone column; and as the amount of relative beauty, (or that which is occasioned by the just proportion, distribution, and elegance of arrangement, of the separate parts and features of a structure,) must be synonymous in *either* art, being equally important and indispensable in the *one* as in the *other*,—it is perfectly clear, that the Architecture which shall *add* to the same amount of relative beauty, in the combinations of its parts, a *larger amount* of positive beauty, in the parts themselves.

will produce, on the whole, a higher and more perfect order of beauty than the other.

But illustrations of Architecture require to be viewed, not alone in themselves, but in relation to the effects of the natural phenomena, to which, if carried into execution, they must inevitably be exposed; and in this respect, an Architecture, the constituents of which are of the general character alluded to, will possess a more widely extended interest, from the peculiarity of its effects, than any other. For, in addition to the greater degree of *positive beauty* exhibited in the features themselves,—and in addition, also, to the *relative beauty* resulting from the harmony of their proportions in distribution,—*a third*, and singularly beautiful effect, is inherent in and peculiar to *this Architecture*, and this is *the optical effect*, occasioned by the projection of the SHADOWS of the forms of the perforated or extraneous features of edifices, on to the primal masses, walls, or other parts thereof,—by means of the application of the requisite constructive principle, and the introduction of suitable color, combined with the natural agency of light: thereby producing *an additional and interesting variety in effect*, consequent upon the ever-changing intensity of light! and ~~the~~ varied positions and motions of the spectator,—an effect peculiar to the development of the properties of metal in art, and altogether out of the power of any other Architecture systematically to accomplish.

The principles of this art, set forth in the preceding

chapters, have especial reference to the properties of FORM, and the production of the beautiful thereby ; but in order to prevent any misapprehension in respect to the sense in which the expression of “ the Beautiful ” is to be understood, it will be requisite to bear in mind that the term *beauty* admits of being received in a two-fold character of significance ; namely, the *Æsthetical*, and the *Argumentative*. The former implies an instinctive and immediate recognition of its existence, without reference to any other utility in the object possessing it, than that of the excitement of elevating and pleasurable emotions in the mind. By the latter, it is inferred, that we examine the *uses* to which an object is applicable, and the nature of the purposes it is required to serve ; and discovering by a process of reasoning, the fitness of an object (or of the concomitant parts of an object) to serve the end and purpose of its formation, recognize beauty in utility. The former is the impulsive and artistic ; the latter, the reflective and scientific application of the term beauty, or the beautiful.

Architecture, however, embracing physical and positive utilities, in its intentions and operations, as well as in its character of an art, producing effects which are calculated to excite and gratify the natural and intuitive impulses of the mind, necessarily aims at the accomplishment or realization of *beauty in this two-fold sense of the expression* ; and hence it occurs, that while the primary intention of Archi-

ecture, cannot be fulfilled without beauty, neither is it possible to satisfy the intellectual as well as imaginative, being by any endeavour to produce beauty which is inconsistent with, or contradictory to, the requirements of *utility*. And therefore it is, as comprehending the union of utility, with abstract excellence in effect, that the term "beauty" is most justly received in relation to this, as well as to all other Architectures.

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The peculiarities of COLOUR, occasioned by the conjunction of the several metallic bodies and compounds, forming the constituent materials of this Architecture, have now to be considered.

For the production of peculiar architectural effect, as well as for the exhibition of these qualities of metallic bodies, provision is effectually made in the economy of this art—not only for the harmonious distribution of colour throughout the *primary surfaces* of its productions, but also for the exhibition of various modifications of colour or effect in the *extraneous or decorative features* of the Architecture, in their relation to such primary surfaces: for example,—the solid, or apparently solid wall, or other portion of a given structure, being composed of cast-iron plates, externally coated with enamel, (namely, "carbonate of barytes,") paint, japan, or other suitable substance of any

desired colour ;—or, of brick, or other convenient substance, which may be covered with any suitable species of cement, or composition, and rendered representative of the effects of the forms and arrangements of such plates, and to which corresponding colours are applied ; while the extraneous or decorative features, whether of open-wrought, or other design, are of iron, coated with copper or zinc by the electro process, or otherwise modified by the application of colour, or may be composed of bronze.

On the other hand, the extraneous or decorative constituents of the interiors of edifices, may be composed of variously finished brass, or any composition that may, (by gilding, or otherwise,) be brought to assume a similar appearance, and possess the requisite firmness and durability,—while the wall or surface over which it is erected, may be enamelled, japanned, or painted, in any modification of *colour*. Varieties of *resplendency in effect* may also be attained by the several methods of working and finishing, of which metallic substances in general are susceptible ; as, for instance, in burnished, dead, or frosted silver, gold, brass, steel, etc. ; the effects of which may be still further modified, by the occasional introduction of minor features, composed of variously cut and coloured glass—after the manner of the setting of gems in jewellery.

But further : while the introduction of various colours, for the production and modification of effect, is one of the essential conditions of this Architecture,—conformity with



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the principles and legitimate intentions of art in general, will forbid the super addition of colour to such forms of *natural objects* as may be adopted in the arrangement of its decorative constituents, for the purpose of producing any merely *mechanical* fac-simile or precise imitation of the same.

The due exhibition of the optical effects, peculiar to this art, will necessarily demand the general selection of colours of light and delicate tints for the walls, or other plain surfaces of its respective productions.

In the practical application of *colour* in this Architecture, nothing further is required, than the preservation of consistency, and the production of "the beautiful."

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The unbounded resources of this Architecture, in respect to the composition of its extraneous or decorative features, and the variety of character and expression which may be realized, by the adaptation of the *forms of natural objects* to these purposes, will render the selection of such objects a matter requiring a considerable amount of taste and judgment on the part of the practitioner. And in order to enable him to impart an appropriate character and expression to his productions, the artist will find it necessary to give attention to the external anatomy of organic productions, and the economy of nature in general; also, to the

*poetry of nature* exhibited in the infinite varieties of character and expression infused into her works. No particular rule, however, can be established in reference to these selections. The artist will generally find it requisite to consider, first, the purpose to which his work is to be applied, and the nature or quality of the materials to be employed; and then, (after having determined the general character and proportions of his structure,) to select such a series of objects for adaptation to these ends, as shall harmonize in sentiment and feeling with the intended purpose: as, for example, the decorations of a structure intended for a sacred purpose, in which the forms of *botanical objects* are introduced, would be most appropriate, if the forms of those productions of which especial mention is made in Holy Scripture, as the palm, the olive, the vine, pomegranates, etc. were admitted into the composition; whilst for a judicial, scientific, or similar purpose, the bay, the olive, and the oak, with other classical emblems, might be conspicuous; for a palace, or similar structure, a richer variety of floral and exotic decorations might be chosen; for bridges, quays, baths, etc., marine and aquatic productions might be selected. In regard to the application of the forms of the higher orders of natural productions, or any mythical modifications thereof, the rules generally requisite to be observed in the practice of the pre-existent arts, are equally applicable in this.

In reference to the particular manner in which the forms of botanical, and other natural objects, are to be employed

and arranged in the composition of the extraneous or decorative features of this Architecture, little, beyond what has been previously set forth, can with advantage be laid down in theory alone; and in these respects, as well as those relating to the particular introduction and modification of *colour*, as also in the arrangement of *forms* in general; the practitioner of this art, at all times, but more particularly during the period of its infancy; while duly considering the primary and fundamental principles upon which it is based, and the intentions it proposes to accomplish; bearing also in mind the general character of his work, and the particular nature of the objects selected for representation,—must, to a certain extent, be *a law unto himself*; until, in the course of its practice, specimens of the art are produced, which, synonymous with those of the pre-existent arts in general, shall, by universal consent, present examples of excellence, out of which particular and technical laws and rules may be elicited, for the guidance of the artist, in all future applications of the primary and general principles of this art.

In this art, however, opening as it does so wide and extensive a field for the exercise of invention, it is far from being contemplated, that the precise and unvarying methods of the *imitation* of preceding examples, so prevalent in the practices of the pre-existent Architectures, should be maintained; and notwithstanding any degree of excellence which

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fundamental principles, the unbounded resources of its forms, and the unlimited capabilities of its material, will enable it to maintain, to a far greater extent than any pre-existent Architecture, the character of an art of *invention*, rather than of imitation.

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The principle of PROPORTION, however, being that upon which in vital excellence in *all art* may so far be said to depend, as to be incapable of attainment without it; and which, in reference to Architecture, may be taken to include (or that its realization will accomplish) the *just* combination, distribution, and arrangement of the respective and concomitant parts and features of its productions; because proportion, if really and effectually developed in a work of Architecture, will be found to have effected the adjustment, and established the relationships of all the parts to each other, and of their connection in *an uniform and consistent whole*,—and this, whether as regards the disposition of its primary masses, the forms exhibited in its distinctive features, the amount of superficial space they shall be found to occupy, in connection with that which in this sense must remain unoccupied, the various degrees of *projection* they exhibit, or the regulation of the forms and quantities in which *colour* shall be disposed.

less important in the practice of the art, now under consideration, than it is in that of the preceding Architectures; a *difference*, nevertheless, will exist in the means by which it is exemplified,—a difference which, doubtless, will be better understood, by considering, (so far as the brief limits of this essay will admit) *the nature* of the principle itself, and the circumstances necessarily attendant upon its development in an art like the present.

*Proportion* may be defined to be *the result* of the just and appropriate balance of the several members, parts, or features, of which any production is composed, and by which we comprehend or infer the existence of correctness or perfection in their relations.

It is purely a *metaphysical principle*, or law of the mind, although it occasionally admits of being tested by physical means,—its existence in many instances (in much of classic Architecture, for example) may be ascertained by measurement; but then the mind, either from precedent, example, or by its own innate perceptions or conviction, must have previously determined, that a certain aggregate or amount of these measurements, in relation to the objects to which they refer, elucidates or realizes the principle.

Many, however, if not *all* the higher purposes, phenomena, or things, in which this principle is developed, or wherein it may be found to reside, do *not* admit of the test of measurement, numbering, or calculation, as final and accurate proof. In reference to organized nature, for example,

in the animal economy, it may serve to describe the more palpable and prominent differences between one species and another, as between *man* and the *baboon*; it may also serve to indicate, although not with accuracy, any extreme differences in the same species; but as the existence of this principle in organic nature, is proved by its result in the consummation of beauty and harmony, the physical test of measurement becomes obsolete or inefficient, and must of necessity give place to the metaphysical one of *recognition*; or, in other words, the existence or realization of *proportion* in the productions of organic nature, cannot be ascertained by measurement or calculation, but must be *perceived* and *felt*.

This truth, therefore, being arrived at in reference to the works of nature, *it* follows as a necessary consequence, that it must equally and in like manner apply to all those works of art which have nature for their prototype; and consequently, it is obvious that in an Architecture, the chief constituents of which are derived from the forms exhibited in the works of creation, and the various combinations thereof, the system of measurement must of necessity prove *a far more fallible test* of the existence of the principle, than is found to be the case, in application to the productions of its more mechanically scientific prototypes, viz. pre-existent and established Architectures.

But notwithstanding, as has been previously set forth,

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objects wherein in reference to art it is found to reside, cannot be reduced to the comprehension of the understanding by means of measurement; yet, so far as the principle is susceptible of elucidation by these means, it becomes capable of practical development in Architecture in general, by some species of rule or method. Such rules or methods, even in the pre-existent Architectures, are still to a certain extent unfixed and indeterminate; notwithstanding the endeavours of the Italian writers, to reduce them to uniform and prescribed limits, thereby degrading the practice of the art into little better than a mechanical science. For almost every example of antiquity furnishes an illustration of some peculiarity or variation in the realization of this principle: and that the Greeks (our highest authorities on this head, as well as on art in general) did not design and construct from rules of proportion which were fixed and unalterable, the whole history of Architecture sufficiently testifies. In their most celebrated productions, the science exhibited is invariably modified by that principle (if the term be allowed) of *ideal beauty*, or of homogeneous fitness of parts to the whole, which infallibly proves that, with them at least, the art was not suffered to be lost in the mechanical science; and a privilege or liberty of ranging within certain limits, is, after their example, as well as by universal consent and practice established in the art.



## THE NATURE OF

It is more particularly in respect to the relative dimensions of *columns*, and their entablatures, with the arrangements thereof, that *rules of proportion* have been attempted to be established in the masonic Architectures; but, the superior strength and tenacity possessed by *metals*, and their facility of adaptation to constructions for which the nature of *stone* is entirely unfitted, renders the employment of columns *to an equal extent* in the metallurgic as in the masonic Architectures, altogether unnecessary; and being, in equivalent amount, *unnecessary*, cannot be artistically desirable, so long as the principle be admitted, that beauty in Architecture should *issue out of use*.

The circumstance, also, of the projective or external features of this art being composed of hollow perforated work of the most infinitely varied forms, character, and degrees of delicacy; instead of the opaque masses necessarily employed in masonry, and the forms of which are so far restricted by precedent and custom to those of geometric character, as to be generally determinable by rule and measurement; to an equal amount of which it is impossible the Architecture in question, if maintained in its integrity, can ever be subjected; and, may it not also be added, by which the practice of it as *a fine art* can become degraded.

Nevertheless, so far as relates to the respective dimensions, and arrangements of the primary masses of a structure; the correspondence of centres, with its wings or abut-

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duction of sky and general effect—the comparative dimensions, and distribution of doors, windows, etc.—such technical rules, as are found to prevail, in the practices of pre-existent architectures—may be applied to facilitate the development or exhibition of *proportion* in the productions of this Architecture ; subject of course, to such discretionary modifications on the part of the artist, as shall render them consistent with the distinctive principles and intentions of the art.

The general character, however, of the extraneous or decorative constituents of this Architecture rendering them less amenable to the *test of measurement*, it follows as a necessary consequence, that the means or influences by which the proportions of such objects become regulated and determined, are of a more abstract and metaphysical character. As, therefore, no definite or mechanical rules can be laid down for the *proportions* of these parts and features in themselves, neither can there be for the *arrangement* of the same ; and consequently, *proportion* in any given work, as a whole, if effected, must be so in a manner synonymous with that by which the principle is exemplified in an ideal statue ; namely, through the mental operation of feeling and judgment in the artist. In the design of these features, it will be requisite to consider—first, the preservation of harmony and consistency, with the nature of the objects chosen for decoration, whenever the forms of natural

adoption of such forms and methods of arrangement as shall, if not actually represent, at least, not violate or contradict the course of nature, in the object represented : a just medium between these extremes, it should ever be the endeavour of the artist to maintain ; too close an imitation of nature, being mechanical and uninteresting ; whilst a total disregard of her laws and operations (unless in illustration of poetic sentiment) is absurd and offensive. Secondly—the attainment of due effect by such methods of arrangement, as shall exhibit, the extraneous or decorative features to the greatest advantage, in reference to the general effect of the structure ; and the locality, or point of sight, from whence it is usually viewed, and by which the *optical or protean effects* peculiar to this art, must necessarily, and to very considerable extent, be influenced. And Thirdly—it is requisite, that in relation to any given work as a whole, a due apportionment of modified and contrasted colour be effected ; in order to the realization of the *peculiar* beauty and harmony, which is the primary intention of this art.

Such further technical and peculiar laws and rules as have not, either in this or the preceding chapters, been set forth, but which must necessarily influence the future practices of this art, being of a less definite character than those which appertain to arts based on the externally developed combinations of geometrical, rather than of natural forms ; are therefore (in common with all those by which the highest

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enunciation, and of becoming intelligible to other minds, by the illustration of experimental application and practice: the apparently most advantageous course to be in the present instance pursued, whether in reference to the progress of the art itself, or the interests of those who may become its practitioners,—is to direct especial attention to the primary and fundamental principles upon which it is based, as also to such specimens and illustrations as are already, and will, it is hoped, from time to time be produced,—in order to a due comprehension and perception of the general intentions, capabilities, and effects of the art, and the means and methods by which the same may become realized and developed.

## CHAPTER VII.

### OF THE GENERAL ECONOMY OF THE SYSTEM.

The term *economy*, in relation to a system of Architecture, is equally applicable to two distinct classes of contingencies, namely,—such as are the inevitable result of the nature of the elements and of the principles upon which the art is based,—and such as are, and always must be, affected by, and dependent upon peculiarities of time, place, and circumstance. The former of these contingencies necessarily embrace the various peculiar *effects and utilities of the art*, progressively described and referred to in the preceding chapters. In treating, however, of this portion of the subject under a distinct head, it becomes necessary to examine into the precise nature or character of the various effects and utilities in question,—to arrange them in juxtaposition one with another,—to observe their respective bearings upon each other, and in relation to the purposes they are collectively intended to serve,—in order to elucidate or make manifest the true economy of such a system.

In the first chapter of the present work, the true purposes of a new system of Architecture are defined to be,—first, the attainment of a description of beauty or effect *integrally dissimilar* from, and if possible of a higher order, than that exhibited in the pre-existent Architectures. The first concomitant of such beauty being *a new order of forms*; the second, various and peculiar combinations and modifications of *colour*; a third peculiarity being capable of production, by attention to the various effects of *the natural phenomena of light*, acting upon its respective productions.

In the second place, the requisite *utilities* of a new system were declared to consist in—comfortable modification of temperature, or the counteraction, as far as possible, of the effects of heat in summer, and cold in winter,—durability, dryness, cleanliness, free admission of light, general convenience and economy of space, security against fire, etc.—and facility in erection, and for the removal of structures, without the injury or destruction of their respective parts.

It will now be necessary to enquire, how far the system of Architecture, set forth in the preceding chapters, answers to the several requirements above mentioned.

In respect to the nature of the beauty, capable of being produced by the application of these principles, it will be found in every respect answerable to the required ends. It embraces a new order of forms, integrally and extraneously, in design and in construction, *dissimilar* from those of pre-

ceding systems,—an order of forms, moreover, of higher character, inasmuch, as they are derived from the productions of *nature*, in which it is unquestionable the highest order of beauty resides,—new combinations and modifications of colour and resplendency,—together with an entirely new species of optical and protean effect, occasioned by the natural agency of light, acting upon its peculiar forms and combinations.

In the various *utilities* resulting from the application of this system, a perfect coincidence with the respective requirements, is also observable. In respect to the general modification of *temperature*, as also to the preservation from fire, it has been shown in the fifth chapter, that houses composed of double iron plates, in accordance with the primary constructive principle of this art, are, above all others, best fitted for the accomplishment of these ends.—The *durability* of metallic constructions of such a nature is indisputable; both on account of the native properties of the material, and the facts to be derived from experience of its extensive application to various synonymous purposes, especially those of ship-building, bridge-building, the erection of lofty towers, as light-houses, dwelling houses for exportation, as well as innumerable other purposes of similar character.—Security from the unhealthful and unpleasant effects of *damp walls*, is effectually attained, through the non-absorbent properties of metal; and from the fact, that no material or composition of moist character



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is required to be employed in the erection of its parts. The preservation of the greatest possible amount of *cleanliness* in edifices, is from several causes an important peculiarity in the economy of this system: first, on account of the generic character of *its forms*, the general predominance of the *curved* over the straight line, and the consequent avoidance of positive right angles, as observable in the animal economy of nature, and especially of the junction of right angles, so prevalent in existent Architecture and buildings; and which, in the arrangement of domestic edifices, is productive of so large an amount of trouble and dissatisfaction, from accumulations of dirt, which it is impossible thoroughly to eradicate, and the harbour of spiders and other annoying insects.—independent of the injury and continual wear of the plinth, occasioned by the necessary cleansing of the floors of apartments, staircases, etc., all of which inconveniences will be effectually removed by the substitution of the *curved* line for the straight.

The superiority of *this system* over all others, in respect to *external cleanliness*, is no less peculiar and important. In the first place, the material is non-absorbent of moisture, and therefore, not liable to the growth of vegetation on its surface, and the consequent adhesion of sooty and earthy particles thereto, as is the case with stone. And if *the carbonate of barytes*, (namely, porcelain coating) be applied to the iron plates, the greatest possible imperviousness to the adhesion of dirt of every kind, is permanently attained.

tem, in respect of cleanliness, arising out of the nature of the *constructive principle*, is at once apparent. In masonic architecture, all the mouldings, and other decorative features, are necessarily carved in relief, or moulded on the surface of the wall or other plane, thereby creating innumerable hollows for the reception and retention of dirt, etc. The present system, on the contrary, by requiring the extraneous or decorative features of edifices to be maintained in advance of the walls, or other plane surfaces thereof, *effectually provides for the perpetual cleansing and drainage of the same*, by the natural action of wind and rain. Free admission of light, and convenience and economy of space, is the result of the far less frequent employment of columns, than heretofore ; and the circumstance of these, when employed, being *perforated*, instead of opaque masses ; together with the introduction of delicate transparent metallic manufacture, in the appendages to the heads of windows, etc., for the purpose of merely checking the force of the solar rays in their entrance into the interiors of edifices ; instead of the total exclusion thereof, and the frequent occasion of inconvenient darkness in apartments, resulting from all similar attempts in previous Architecture and Building. Facility for the abundant introduction of the necessary instruments of artificial lighting, as likewise of those required for the efficient ventilation, and warming of buildings, in perfect accordance with

the general effects of this art, is another peculiarity in its economy.

The greatest possible security against fire, electricity, etc. is an inevitable consequence of the application of iron in building, on the principles herein before described.

Facility in erection, and removal, being fully effected in the circumstance of the respective parts of edifices, being put together, by means of pins or rivets, instead of mortar, cement, or other adhesive substance, requiring considerable time to dry, and involving the serious injury or destruction of the parts, in removal.

Such, are amongst the most important advantages immediately resulting from the peculiar economy of this Architecture; many of which are equally attainable, even though the walls, and other primal parts of its productions, are composed of brick and bitumen, cement, or other ordinary material, and the internal decorative features thereof, be executed in *other* than metallic substances.

There yet, however, remains to be noticed, the singular economy in the effects of the Art in question, and in which respect, no other Architecture whatever can possibly be placed parallel with it; inasmuch, as from the general character of its component parts, and the peculiarity of its constructive principle, every object of decoration, is not only exhibited to the greatest possible advantage, but, by the natural agency of light, acting thereupon, each indi-

once, but under certain influences, frequently several times; thereby becoming conducive to the uniform production of the optical and protean effects, peculiar to this art; effects as beautiful, and continually interesting in their variety, as they are *entirely gratuitous* in production.

Another point of peculiarity in the economy of Metallurgic Architecture, arises out of the nature of its manipulations, and the circumstance of the preparation of every repetition of its respective features being effected by means of casting, from *one model*, instead of individual hand work; and as the production of these models would necessarily form a considerable portion of the expenditure on such a structure, it is obvious, that the true economy of the system will be most effectually developed in works which are dependant for their effects, upon the frequent repetition of the same parts and features, rather than upon the unrestricted application of such, as are found to exhibit the greatest variety of character.

In this respect, however, the economy of this branch of metallic manipulation, so far from being derogatory to the general excellence of this art, is calculated to exercise the most salutary influence over its practices, by restraining within due limits the caprices of uncultivated taste or mere fancy, (for the indulgence of which the almost unlimited capabilities of its material would otherwise afford temptation) and by compelling, as it were, a continual dependence upon

most enlightened ages and nations, is proved to be an indispensable concomitant of true excellence in architectural effect, namely, *the frequent and uniform repetition of its respective parts and features.*

This repetition of parts is, indeed, a necessary and indispensable contingent of all, especially the purer and more perfect styles of Architecture; and is found materially to affect the economy of architectural operations, even when limited to masonic labor. But the peculiar economy in this respect, of the system now under consideration, is the application of the process of *casting* for these purposes, instead of the use of the chisel.

On the examination of any good production of the anciently derived Architectures, this repetition of parts will be found to prevail to a greater extent than might at first sight be apprehended. Columns, entablatures, buttresses, pinnacles, basements, mouldings, window and door dressings,—in short, almost every feature of a composition is necessarily many times repeated; and, notwithstanding the Metallurgic Architecture is essentially *dissimilar* from all others, both in design and in construction, the *repetition of parts*, for the production of beauty in architectural effect, is no less indispensable in the *one* than in the *others*.

The preparation of models for casting is necessarily attendant with considerable expense; but the smallness of the number required for any single structure, unless it

ordinarily variety in detail, will largely counter-

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act the effect of original cost, from the fact, that any number of casts may usually be taken from one model, at little more expense than that of the raw material employed; and it is therefore evident, that for all edifices of great extent, for streets and terraces of houses on one scale, the Architecture in question cannot be otherwise than *peculiarly economical*. But further, *while the destruction of the models prepared for any given edifice, will necessarily secure the patron or proprietor from the consequence of the repetition of the same by other parties*; yet, if any proprietor of such models be inclined (after the erection of his work) to dispose of them to any parties, duly authorised to conduct the *practical operations* of this art, they might with perfect propriety be applied to similar purposes in other places than that in which they were originally erected, either at home or abroad.

But the models and casts of the various parts and features *above referred to*, will be found perfectly capable of *re-arrangement*, and adaptation to *other* descriptions of structures, and in numerous other forms, than those for which they were originally intended; but which, nevertheless, by the exercise of skill on the part of the architect in re-adjustment, and the judicious introduction of some additional features, may possess the merit of, at least, as large an amount of originality, when compared with the primary structure, as is found to attach to the majority of compo-

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An important view of the subject yet remains to be considered; and that is, the circumstantial and fluctuating economy of this Architecture,—necesssarily dependant upon the ever-varying contingencies attendant upon the general state of art, commerce, and manufactures in metals, and other substances applicable to the several purposes of this art. Before, however, any opinion can be justly formed on this head, a large amount of correct and carefully digested evidence will be necessary; and evidence to a very considerable extent of a nature, which it has not hitherto fallen to the lot of the practical architect to require. From the great extent, nevertheless, to which *cast iron* is employed in general architectural practice, a valuable fund of knowledge and information must necessarily be possessed by the profession at large; and which, after due allowance has been made for the differences in construction and design, attending the application of this material in the *metallurgic architecture*, could not fail of proving highly advantageous, as furnishing perhaps, the most satisfactory, because the most direct practical evidence, that can *at present* be obtained, in elucidation of this portion of the subject. Much more, however, will evidently remain to be procured, than is at present in possession of the profession, in reference more particularly to the production of *decorative work in cast iron*, as well as to every other means or process by which, not only iron, brass, copper, etc., but all other metallic substances and



compounds, as also such available substitutes for these bodies, as are capable of being applied to the various purposes of this art; the majority of which, however, are already in constant use in existent Architecture.

In the absence, therefore, of such a fund of circumstantial evidence, as can alone enable any accurate judgment to be formed respecting the comparative cost of production, a considerable degree of caution will be required on the part of those who may be disposed to patronize the art,—in order to guard against the many hasty opinions, which will doubtless be hazarded on the subject; as well as the wilful misrepresentations of those, who may either directly or indirectly be interested in opposing the advancement of this system; and who would evidently endeavour to attack it on the ground of economy, from their utter inability to gainsay or invalidate *the principles* upon which it is based. An attempt will doubtless be made to prove, that cast iron is an expensive material in construction: but if so, why is it so largely employed in existent Architecture for rafters, trusses, roofings, and similar purposes? It may be replied, that this is on account of superior durability, and non-combustion. But, it must also be attended with a degree of cheapness, or it would certainly not be applied to purposes where no other advantages than these are gained by its use. If cheapness, as well as durability, was not a principal recommendation of this material, we should certainly not, twenty years since,

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when less facility for the manufacture and conveyance of metal existed, than at present, have had columns of cast iron applied to such works as, The Quadrant, Regent Street, and elsewhere, and applied for the purpose of counterfeiting stone. It would not have been adopted upon occasions such as these, had it not been *cheaper* than the legitimate material, and *cheaper* even, than its ordinary substitute, brick and cement.

It may still, however, be said, that *cast iron* is expensive in construction: but if so, why is it now so extensively adopted in ship building? It most unquestionably possesses many other advantages over timber; but, if it had not *cheapness* also to recommend it, we should still continue to use the material, which, as long as man has known the use of ships, he has been content to employ for these purposes. But, after all, it may be said, that ships are plain and merely useful constructions; and when the decoration required for civil architecture has to be added, it is expensive. So is all architectural decoration; that of masonry, especially; and in comparison with this, the only thing to which it can in justice be compared,—it is altogether erroneous to assert, that cast iron decorations are necessarily expensive. In masonry, every individual feature, or ornament, (and these in extensive structures are frequently repeated many hundred times,) *every one* of these parts, is required to be produced by the hand-work and chisel of the mason; whereas, in the case of iron, or other metallic

features and decorations,—when a model of one single part is prepared, an unlimited number may be cast from the same, at little more expense, than that of the material employed. Neither is this state of things calculated to *diminish*, but on the contrary, would greatly *increase* employment; for, independently of the newly awakened demands of commerce, this system would occasion; the large amount of labour required in the preparation of the raw material, would prove far more than sufficient to counterbalance that which might in some degree be subject to suspension:—but of this hereafter.

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The peculiar contingencies attendant upon the production of every individual work, whether in this, or any other architecture, requiring to be entered into with technical exactness,—before any correct estimate of its expense can possibly be made; it is evident, that positive and circumstantial evidence of this description, cannot possibly be given, unless a particular design be prepared for an example—a particular locality chosen for its erection—the style and manner of its execution, in detail, determined upon—and the materials selected, of which it shall be composed.

But, notwithstanding the impossibility of instituting any fair comparison with the productions of any other Architecture, in consequence of the total dissimilarity of its ef-

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fects, an impartial examination of the means proposed, will render it obvious, that a very considerable amount of richness and splendour, especially in the case of interiors, may be produced in this art, at less expense than that attending the production of any equal amount of magnificence in the existent Architectures.

## CHAPTER VIII.

### REMARKS ON THE PRESENT STATE OF ARCHITECTURE, AND METALLIC ART IN GENERAL.

Before any correct judgment can be formed of the true value and importance of the discovery of the System of Architecture herein propounded, it will be necessary to consider, the state in which *we are*, and have hitherto been, in reference to the practices of Architecture,—and the state in which, it requires but a small amount of prophetic foresight to perceive,—that England may eventually be found, when the practices of a genuine Metallurgic Architecture shall have become associated with the tastes, habits, pursuits, and interests of her people.

It has in various parts of this essay been explained, that all the Architectures practised throughout the successive ages of the world, are based upon the properties of the *same material*, and are therefore incapable of producing any *entirely and integrally dissimilar effects one from the other*.

Numerous and important modifications in these effects, amounting to *distinct styles* in Architecture, have at several periods of history been produced. But it has long been held as a reproach to this country, that (notwithstanding she may, perhaps, claim the merit of producing a variety in the Gothic style) she possesses no Architecture—no style of Architecture—that can be called *her own*. Babylon, Hindostan, Egypt, Greece, Rome, the Moors, the Mohammedans, and, if it be worthy of being so termed, the Chinese, have each an Architecture, bearing the name of the respective nations or people that produced it. But Great Britain, a nation which in the vastness of its territories and power may justly claim to rank amongst the greatest of these, has no Architecture of her own, and has therefore been condemned to adopt and imitate the practices of nations long extinct; but in which somewhat humiliating task, she has hitherto been kept in countenance by the united practices of all Europe. Yes, England, in common with all Europe, in the nineteenth century, (notwithstanding the immense difference in her state and circumstances) has no Architecture—but such as other and remote ages have left to her. The hidden treasures of the earth have been revealed to her in the greatest abundance,—Science has succeeded in bending the elements to her will, and in producing results almost surpassing poetic fancy to conceive,—the mechanical arts have been essayed to an almost incredible extent, and still continue to advance with

giant strides to the accomplishment of innumerable things unknown to our forefathers,—and yet in Architecture, the most valuable, the most important of the arts, no endeavour appears to have been made to conform to the spirit of the age,—to adapt the numerous elements with which practical science has presented us, for the real advancement of art,—the same materials, the same forms, the same methods of construction are employed: We are still where Greece, and Rome, and Middle-aged Europe, left us,—with the exception, that in attempting to avoid the mere mechanical imitation of their productions, we are most lamentably, continuing to depart, from the excellence to which they attained.

This is no mistaken view, or exaggerated picture; but is founded upon facts, which a very slight acquaintance with the practices of the ancients, and a comparison of their productions with our own, will fully prove: neither is it confined to individual opinion, but is universally acknowledged by professors of the art, and has, in an infinite variety of ways, been reiterated by innumerable writers on these subjects, all of whom, however, appear capable of little more, than giving utterance to expressions of regret, contempt, and humbled pride, at the continuance of such a state of things.

The celebrated modern traveller, Mr. Kohl, who in his somewhat recently published Travels in Germany, Russia, Prussia, England, Ireland, Scotland, etc., has fully proved



himself a writer of enlarged and philosophical views, and a comprehensive and usually accurate observer of men and things, makes the following remarks on the architectural practices of Modern Europe :—

“ This (alluding to the Cathedral of Glasgow) is another of the hundreds and hundreds of Gothic Churches, which, in the year 1842, was undergoing restoration and repair throughout Europe. In ten years time, probably, Gothic Europe will stand among us again, as it existed in the 14th and 15th centuries. Every where, in the whole of Scotland, as in England, Belgium, Germany, France, and other countries, I found this spirit of Gothic *restoration*, and Greek *imitation*—I must add—*astir*. For in Glasgow, as in other British towns, one is astonished by the number of buildings erected in Greek taste, and provided with an incredible stock of Corinthian, Ionic, and Doric columns. This imitation of Greek buildings, is a *phenomenon* to be found throughout all Europe, from the Exchange in Petersburg, the Museum in Berlin, the Glyptothek in Munich, to the Magdalen Church, and the Bourse in Paris, and the Exchanges in England and Scotland. It is really remarkable how active we are, in these Gothic and Hellenic forms, and how naturally we turn to the one or the other, whenever any thing on a great scale is to be built.

“ Some hundred years hence it will be remarked, that the 18th and 19th centuries, were not able to strike out

a style of architecture for themselves.\* Is it then quite impossible to escape from the Greek columns—the Byzantine cupolas—and the Gothic towers and arches?—and are Architects to be condemned for ever to ape this ‘Classical Antiquity?’ Are no different forms and shapes to spring out of the ground, and brain of man? If we cannot conceive any such new form, that is no sign that such a conception can never start into life. The Greeks, in their time, could have had no idea of *a gothic tower*, and the beauty of *a gothic cathedral*. It is indeed, singular, that we find none of our Architects gifted, with sufficient imagination—that we could give him a commission to execute a building, in an *entirely new*, but no less beautiful and classical a style.”

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A clever essay on the use of cast iron in Architecture, and evidently from the pen of an experienced Architect, who however, for reasons which remain concealed, has not thought fit to avow himself, has recently been put forth by “The Institute of British Architects.” Amongst other remarks, in reference to the character of modern Architec-

\* Our Author is somewhat premature in this remark.—Had he been aware of the discovery which, at the time of his writing, was already in existence, he would have paused before he included the whole of the 19th century, in his otherwise just predictions of the opinions of posterity.

ture, and the employment of this material, the writer says :—

“ Whether we contemplate the architecture of the Egyptians or the Greeks, the stupendous piles of the Eternal City, the gorgeous monuments of the Gothic style, the mazy intricacy of the Alhambra, or the finished productions of modern Italy, the mind perceives, in each and all, the adaptation of the means to the end, and the development of the spirit of the age and country, in which, and for which, they were created, and these form the essential principle of the relative beauty of Architecture. Now where shall we turn to find the beauty born from the spirit of our age and country, in the Architecture of the nineteenth century? The very proposition at the head of this paper is an answer. In the nineteenth century we are in possession of a material in extensive operation, offering us new modes of construction, new proportions, the power of creating new forms and combinations, differing from every thing that has preceded them in art. It is now sixty-two years, since the erection of the bridge at Colebrook-dale first revealed the capabilities of cast iron in construction on a large scale; and during that period, science and cast iron have marched hand in hand, with strides it is amazing to contemplate. But what has *art* effected with this new power? The Institute of British Architects are still at the enquiry “ what effect should result to architectural taste, from its general

introduction?" In the real adaptation of cast iron to Architecture as an art, we are much where the Dorians were, when they had placed four trunks of trees in a row with a tile upon each. There the Doric order might have remained, had the Dorians been of our stamp, and there it would have remained had trunks of trees instead of cast iron been first used in construction in our time. Or perhaps the parallel will run closer, if we compare ourselves with the ancients, when they first adopted the principle of the arch, since they combined it with architectural forms already established; as we shall probably do with cast iron whenever we begin to bestow our attention upon it. After sixty-two years' experience, under circumstances through which a new and original style of Architecture might have been developed, we are still where the Romans may have been when they built their Cloaca Maxima.

"To what are we to attribute this stagnation in all our ideas, as regards art in this point of view? Doubtless, to the blind spirit of imitation and obstinate adherence to precedent (whether applicable or not, seems of little importance) which characterises the Architecture of the present day. Where cast iron is to be used, the first requisite seems to be to keep it out of sight, or to make it look as much as possible like something else. To impress upon it the character of a style would be more in the spirit of the ancients, whom we profess to adore. Not that it is in the power of any man to stand forth and say, "I will invent

a style.”\* A style, like a language, must be the growth of time and circumstances; and who is to make the first essay in an age when precedent is “the be-all and the end-all,” and when he who cannot command success, cares not for the higher distinction of deserving it?

“The fatal effect of this spirit on our Architecture might be evidenced in various ways. What has been advanced on the subject of cast iron is very far from being the strongest point in which it might be shown, but the argument must be limited to the question under immediate consideration. It may, perhaps, be further illustrated by a *reductio ad absurdum*. Let us suppose that the Greeks had possessed no marble, but had known the art of casting large weights of iron, and had thought proper to use it ‘with regard to arrangement and design,’ as it *might* have been used in their hands; we will further suppose that the art had been lost; we should, perhaps, still have looked upon the monuments of antiquity so designed and constructed, in the same vulgar spirit with which it has been the fashion to contemplate the Parthenon—as something to

\* The writer is here chaining himself to the very precedent he is engaged in condemning, and argues upon the assumption—that what has not been, cannot be. It is perfectly true, that in the whole History of Architecture, no example occurs of the INVENTION OF A DISTINCT STYLE, at one particular time—far less by any individual effort. It is also true, that time, and circumstances may be required, to furnish the necessary constituent elements, for the consummation of such an event,—and which is particularly exemplified in the case of productions requiring the aids of practical science, and manufactures, as do metals. But, while time and circumstances, have thus co-operated to furnish the means, it is hoped, that in relation to THE ART itself, the evidences now adduced, will prove a sufficient contradiction to the assertion, that—No man can invent a style.

be imitated. How would our 'genius have been cramped,'! (as the phrase is). How should we have lamented at finding ourselves restricted to the use of stone, or marble, in which we should have sought in vain to reproduce the light forms of antiquity! Instead of striking out original proportions, and combinations adapted to our means, we should sit down perfectly convinced that neither beauty nor character could be created under the disadvantage of such materials, and abandon ourselves in despair to the construction of bare walls, the monotony of which might now and then be relieved by the crash of a public building, through the laudable attempt of some *classical* genius to support it on Bath stone columns five-and-thirty diameters high. Extravagant as this notion may appear, it is not without its parallel, in the neglect of the present generation to seek for the elements of beauty, in a material which new wants and new principles of construction, are every day rendering more and more inevitable in our constructive Architecture. It is not, of course, with the intention of suggesting any new mode of treating cast iron in point of art, that these observations are submitted to the Institute; but we may fairly infer that neither the ancient nor mediæval architects who have bequeathed to us inventions in art, which (lacking as we do the vivifying spirit of original thought) it cost us something even to imitate with success, would have overlooked the peculiar capabilities of a material holding so important a place in their constructive Architecture\*, as cast

iron now does in ours. Material has, in all ages and styles, performed an important part in modifying design ; and it is recognised as one of the most important elements of relative beauty, as exhibited in Architecture, that the real and apparent construction should assimilate, and that the soundest Architecture, in whatever style, is that in which art has turned to beauty and ornament the forms and proportions dictated by necessity, or by science.\*

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The following remarks, also, (by the author of this book) extracted from the *Athenæum*, No. 867, will doubtless prove interesting in allusion to the perverted uses to which iron is applied in Architecture, and the general deterioration of metallic art in modern practice.

“ In an article in the *Athenæum* (No. 853,) entitled—*“ Vulcanian Architecture,”* a writer of considerable talent strongly contends against a practice in Architecture, now becoming prevalent, and to which there are many temptations on the score of economy ; viz. that of substituting iron for stone and the work of the mason.

\* Notwithstanding the truth and justice of these and other observations interspersed throughout the essay in question, the singular error of the author, in endeavouring to restrain the capabilities of iron within definitive and prescribed rules of proportion, similar to those commonly observed in Masonry, (and which are totally inapplicable to any material not requiring to be used in a solid mass) would be highly remarkable, was it not one which unfortunately is exceedingly prevalent.



“ There can be no question, but that such practices are derogatory to genuine Art ; which invariably conforms itself to the nature, and applies itself to the development of the properties of its material. It is perfectly true, that all endeavours to force a substance beyond the legitimate capabilities of its nature, has a puerile and bad effect—calculated only to excite the mean sentiment of wonder, in respect to the exhibition of mechanical skill ; and altogether incompatible with the end and purpose of true Art ; which addresses itself to the highest faculties of the mind in the primal excellence of *design*. But no less, indeed rather more unsatisfactory, must also be the result, when the free and ductile properties of a malleable and fusible substance, which offers the most willing obedience to a free and independent art ; is condemned to subserve the purposes of a material of such an opposite and far less yielding nature, as that of stone in comparison with metals. The practice in question is, therefore, doubly reprehensible—first, as degrading Art by a counterfeit of stone and the work of the chisel—necessarily inferior to the legitimate production, because not really what it would seem to be—and, secondly, as equally degrading to the nature of metals ; the distinctive properties of which are utterly disregarded—thereby producing only dissatisfaction and disappointment, that materials possessing such extraordinary capabilities in construction, and in the execution of peculiar design, should be forced into such unnatural situations, where they are

compelled to do nothing, and worse than nothing in the cause of genuine Art.

“The writer in question unequivocally asserts, that ‘metals are illegitimate substances in architecture.’ I apprehend, however, his remark to refer, *not* to architecture, necessarily, but to *existent* or *masonic* architecture ; for, in order to prove the former position, it would be indispensable to show, either, that they were altogether unfit for any purposes of Art—or that the nature of these productions rendered them incompatible with the necessary economy and utilities of architecture ; of which the common experience of every-day life, furnishes sufficient contradiction. But as the true relationship of these substances to the principles and purposes of Art, appears in the majority of our modern applications of them, to be either misunderstood or disregarded ; I would beg to offer a few remarks derived from the most simple analysis, as well as historical testimony, in refutation of the assertion alluded to.

“Did experience fail in furnishing any proof of the application of metals to the purposes of fine art ; an attentive examination of their nature and properties, would bring the mind at once to the conclusion, that they were eminently fitted for its service in a most extensive range of its operations ; for not only do this class of productions afford facility for the embodiment of every form within the power of the sculptor and architect to produce in stone, but, from their malleability, their fusibility, their extraordinary

strength and tenacity, they also afford facility for the embodiment of every other form within the whole range of organic nature or of human fancy, to a degree, so far from being limited, that it may easily be brought to exceed the justly circumscribed boundaries of genuine Art. This occurs whenever a perfect fac-simile of any given object, as flowers, insects, etc., is produced, and which affords no evidence of Art, but that of strict and literal imitation. In this respect, the capabilities of metals exceed those of any other productions, proceeding even to the realization of substantial and enduring cobwebs, butterflies, etc.; nay, further, to the attainment of *motion* in these or similar objects, and the magnetic power of suspension. That metals are unfit for the purposes of fine art, cannot, however, be proved by any *abuse* in the application of these productions, either for the purpose of representing stone, on the one hand, or, the actual embodiment of animalcular forms, and the motions of animal or vegetable life, on the other; *for it is unquestionably between these two extremes that the province of genuine metallic art resides*,—and it is above all others within the path, so clearly described by these boundaries, that the sphere and operations of the fine arts, are capable of the greatest enlargement and extension, and in which England possesses the most abundant, and indeed apparently inexhaustible, physical means for the accomplishment. But, notwithstanding the general deficiency of skill in design evinced in the modern practice of this de-

partment ; and also that the examples we possess of ancient and peculiarly *metallic* art are few in number—and, not usually remarkable for any very extraordinary exhibition of skill, either in design or execution—history, both sacred and profane, furnishes abundant proof of the existence of several species of metallic art among the ancients ; the beauty and excellence of which seem to have surpassed the powers of imagination among the moderns fully to conceive.

“ The dignity and importance of the Fine Arts in general—but of *metallic* art in particular, is fully shown were other evidence wanting in the testimony of Holy Writ, that The Lord, himself instructed the people of Israel, as to the *patterns* of those things He commanded them to make for the service of the Tabernacle, and subsequently for that of the Temple :—and also that the artists appointed to execute them, were gifted with divine power, to enable them to perform the work.—(Exodus, chap. 31)\*. It is not however to be inferred from these revelations of the Divine Will, and exercises of Divine Power, that the Israelites were previously unacquainted with the art of working in metals—for Tubal Cain, nearly two thousand four hundred years before the date of these events, was ‘ an instructor of every

\* This extraordinary favour bestowed upon Bezaleel, Aholiab, and other of the Israelitish workers in metal, and the homage paid to METALLIC ART by the poets, philosophers and people of Greece, in the Apotheosis of Vulcan, (a favor and a homage unaccorded in any comparative degree to the practitioners of other arts,) affords the most convincing proof of the ancient supremacy of art in metals ; and of the sacredness and the honor attendant upon the practical manipulations of it.

artificer in brass and iron ;' and the people, following, no doubt, the Egyptians (amongst whom they had dwelt) in their degrading and idolatrous worship of animal semblances—and during the very time in which Moses was in Mount Sinai receiving the above commands, 'made unto themselves a molten calf, (fashioning it with a graving tool); which was an abomination.'

"The purpose, indeed, (if it be not presumptuous so to express it) of the Divine will in these communications with 'the chosen people,' appears to have been, to establish amongst them a style of art totally and in every respect dissimilar from that in constant practice amongst the heathen nations by whom they were surrounded, in order to avoid the natural association of idolatrous ideas, with the embodiment and representation of idolatrous forms—thereby, under the circumstances of that people, becoming conducive to the corruption of the revealed religion. If the art, so taught of God was not intrinsically dissimilar from that of those nations, where was the necessity for the *revelation* of the *designs*? if the *execution* of those works was to be similar to that already in practice, where was the necessity for the inspiration of the artist? And whether the beauty and excellence of the art so revealed, was inferior or superior to that previously in existence, can only be imagined by considering the different nature of the source from whence it sprang.

"A style of art also, to certain extent consistent with the

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nature of metals, appears to have been extensively introduced into the Temple of Solomon; notwithstanding that the majority of the objects and parts, described in the sixth and seventh chapters of the first book of Kings, were carvings in cedar, which were afterwards overlaid with gold. The works, however, executed under the direction of the inspired architect, by Hiram, King of Tyre, consisting of 'cast pillars of brass, with chapiters (*i. e.* capitals) of netts of checker-work, and wreaths of chain-work, with pomegranates and lily work,' as well as various other productions therein described, appear to have been specimens of more purely *metallic* art, than was exhibited in the Temple itself, while the quality of their execution may be inferred from the character given of the artist, viz. that he was filled with wisdom and understanding, and cunning to work all works in brass.

"But perhaps the productions, above all others, furnishing evidence of the surpassing skill and power exercised over metallic substances for the purposes of Art, are those of the Greeks; described by Homer and attributed to Vulcan—the genius of whom, in this particular department of art, exhibiting no doubt in an extraordinary degree, several of the acknowledged attributes of the Divine nature—was the probable cause of that highly imaginative and enthusiastic people conferring on this being the title and homage of 'god.' The glowing language of the poet, may, it is very possible, have bestowed on these productions

a renown greater than, perhaps might in strict justice, appertain to them; but if the works in question were really emanations of high and genuine art, (and which, from the unrivalled purity and perfection of artistic principle and skill which has established, for 'Greece,' a name above all the nations of the earth—there can be little reason to doubt, they were, in themselves, poems of the highest and most exalted character,—poems in actual form and combination,—and could only in the language of Poetry be either fitly or faithfully described.

“Time, however, will not allow me to enter into the definitions of the immortal Poet, in reference to these glorious productions of Metallic Art, further than to observe, that they were apparently more remarkable for the display of the peculiarities of colour, amalgamation, and resplendency, than of the strength and tenacity of these bodies; and of their inherent capabilities for the production of extraordinary effect in the various methods of casting, working, engraving, chasing, and polishing, of which they are so singularly susceptible.

“Little hope remains, in the present state of affairs, that an art so exquisite in its effects as may be inferred from the above descriptions, can be immediately revived in its pristine excellence; or even that any attempt to restore that which so many ages have been content to bury in oblivion, would be likely to succeed, while the *artist*, who formerly gloried in his power to make these elements conform to his will, is



suffered to be superseded by the *artisan*. Nearly all that now appears worthy of the name of Fine Art in metals, are the productions of the art of sculpture, (practised in conformity with principles applicable to the nature of marble,) and how lamentably in the majority of such works the peculiar capabilities of the material are forgotten, there is abundant evidence to prove.

“ It is altogether a libel on the nature of metals, as well as a total contradiction of the most revered testimony, and of positive proof, to assert, that they are unfit for the purposes of high and genuine Art; or that they are necessarily illegitimate substances for the purposes of Architecture; *they are unfit and illegitimate only in so far as they are unfitly and illegitimately applied*; they are used without any distinct and peculiar principles from those which are found to govern the use of stone, and except in some few rare and partial instances, without any reference to the distinct and opposite qualities they possess. It was not for such methods of working in metals, that the sons of Israel received the inspiration of Heaven; or by such means that the Temple, which had for its Architect the wisest of the sons of men, became ‘ the glory of all lands.’ In the modern use of these valuable substances in relation to Art, there is altogether a want of that species of *inspiring will*, which is a common attribute of humanity, and which, in reference to almost all other than *metallic* Art, is with some degree of freedom exercised.

“ The writer in the *Athenæum*, while justly condemning the common use of iron for purposes of architecture, which ought to be held strictly masonic, seems to lament that ‘ Vulcan is becoming the god of Architects ;’ but judging from the nature of the attempts hitherto made in this way, it is pretty evident that Vulcan has had little or nothing to do with them ; and that if he were again to descend upon the earth, he would spurn with indignation the *iron-founder’s imitations of the mason’s art*, which have been presumptuously perpetrated in his name. Can it be imagined, that he who designed and executed ‘ the Shield of Achilles,’ a work worthy, as doubtless it was, to be ‘ borne from the summit of Olympus,’ as

‘ A blazing present through the skies,’

would for a moment tolerate the prostitution of the elements consecrated to himself, by condemning them to become the slavish representatives of a substance, which, notwithstanding the beauty and excellence it may embody, under the guidance of legitimate art,—is yet infinitely inferior in the amount and variety of the properties it offers for the purposes of *creative will* ! Vulcan has yet to become the ‘ god of Architects.’ The attribute of the god is to create, to develop the properties of things created, to cause each to fulfil its destined office, to express its own nature, to order, to dispose, to arrange all things in their just position, and for the production of the highest beauty ; and this, not theo-

retically, but practically—not in imaginary, but in real and tangible forms—fitted for real and tangible uses ; and until this be accomplished in the application of metals to the purposes of Architecture, such applications will be justly open to condemnation, as mean and sordid, deteriorative of the art they are made to counterfeit, degrading to the free and ductile nature of metallic substances, and disgraceful to the artistic genius of the world.

“ But in extenuation of such practices, it is urged that many advantages in respect to utility are attained by the use of iron in building. Granted :—but why is it not also applied to the production of the peculiar *beauty* for which its nature renders it so eminently fitted? And without which it is not architecturally applied ; for conformity with the primary and general principle of Architecture, would demand, that with peculiar utility should be blended peculiar beauty. It is also urged, that Architects are compelled to resort to the use of iron on the score of *economy* ; that a cry for cheap Architecture is continually raised, and he who can produce the most show at the least expense, carries away the prize. Hence, the substitution of this metal, for classic columns of solid masonry, (as exemplified, among numerous other instances in our own metropolis, in the Doric columns of Buckingham Palace, of the Quadrant, Regent Street, and of Carlton Terrace). Hence, its introduction for towers, pinnacles, canopies, and groinings, in Gothic Architecture, (which

latter practice has hitherto, perhaps, prevailed to a greater extent on the continent than with us ; although, from the greater temptations offered by the facilities which England possesses for metallic manufacture, there is every reason to fear that the baneful example will become prevalent in this country also). Hence, its extensive and increasing application, for the constructive purposes, seen and unseen, of either style. Not that it is, or (according to the intrinsic and fundamental principles of those arts, which have reference to the nature of *stone*, and not to that of *metal*,) can be made to produce more beauty,—not that any originality or peculiarity in effect is obtained, or usually, that any new or improved methods of construction are realized ; but simply because it is *cheaper* than the legitimate material of masonic Architecture, viz. stone, and possesses in a superior degree to that of the occasionally allowable adjunct of that Architecture, timber, the advantages of durability and non-combustion.

“ Inducements such as these we know to be exceedingly powerful, the latter perhaps so far so as to amount to a justification of the practice ; and the attempt to repress or counteract even the former, might be deemed almost futile in a commercial country such as this, where the spirit of competition is predominant, and ‘the cry’ of Cheap ! cheap ! is everywhere resounded. But the public taste is beginning to be awakened, the public mind instructed ; the

principles of genuine Art are becoming known and promulgated ; and the result will be, that what is intrinsically good in an artistic point of view, as well as advantageous in an useful and commercial one, will ultimately be found to satisfy the general requirements.

“Bad, however, as is the practice of converting cast-iron into the *mockery of masonry*, it is far better that these perpetrations should continue, than that an attempt should be made to reconcile the conflicting nature of the two elements, by dovetailing the light and flowing style of design, coincident with the nature of metals, into the opaque and massive grandeur of masonic art. The nature of either substance condemns an union which can only result in discordant effect. If a necessity for the use of iron in architecture really exists ; if cheapness, durability, or facility of execution, offer such irresistible temptations for its adoption, a merit should be made of such necessity, by rendering it subservient to the advancement and extension of genuine Art, in the production of distinct and *peculiar architectural effect*. This, however, cannot be accomplished, without *new principles of design and construction*, without, in fact, an altogether *new system* of architecture. The system need not necessarily confine itself to the use of metals,—numerous other productions exist, capable of being brought into harmonious combination with them ; entirely distinct and singularly beautiful effects might be realized by such combinations, and all the utilities of a *legitimate architecture*

attained ; but the system must be fundamentally dissimilar from that of any art adapted to the nature of stone.

“ If a new species of Architecture be at all desirable, such a system would unquestionably offer the readiest means for its accomplishment. With the material of stone, we cannot, dare not say, that such an achievement is impossible ; but the mind of man has for so many ages, and in so great a variety of ways, essayed its powers in this production, that as far as any thing really and intrinsically original is concerned, its energies appear to be exhausted. With *new constituent materials*, however, the task becomes easier—with *new and distinctive principles*, an impulse is given to invention ; in a new and untrodden path, the energies of genius might be awakened ; and England, with her natural advantages, her scientific attainments, and in the vastness and extent of her mechanical and commercial resources, is the country above all others, in which the operations of such an art might be most successfully conducted.”

## CHAPTER IX.

### ON THE COMMERCIAL, PROFESSIONAL, AND UNIVERSAL ADVANTAGES OF THE NEW OR METALLURGIC ARCHITECTURE.

The foregoing observations and extracts, may perhaps, suffice to furnish to those hitherto unobservant of the facts and circumstances, referred to, a tolerably correct idea of the nature of the past and present practices of Modern Architecture; and of the extent to which the slavish adherence to ancient precedent, has latterly been suffered to restrain or to subdue those higher powers of invention, in which all art first originated, and by which alone, any real advancement of the same can be effected.

It is hoped, that sufficient proof has already been furnished, that the reproach so long endured by this country, and by modern ages, in respect to the non-progression of Architecture, may now be practically removed; and from the superior character of the beauty—and the various superior utilities—capable of being attained, by the practical appli-



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cation of the system of Architecture, herein propounded—a more important extension of art, may now be realized, than is at any one time recorded to have taken place throughout the pages of history—and a larger amount of advantages secured to society in general, than any discovery in art, and few indeed in science, can be said to have accomplished.

But England, in the 19th century, is found to be pre-eminently, *a manufacturing and commercial country*; and we are called upon to supply her with an Architecture in accordance with *the spirit of the age*.

And what, it may be asked, does such a requirement involve? Not alone, the production of new and peculiar beauty; not alone, the power of conforming itself, to a greater extent than any other, to the peculiar contingencies of our own climate, and to the wants and circumstances, domestic, as well as public, of modern society; not alone, involving increased economy and utilities in its arrangements, but calling, to the greatest possible extent, her manufactures into operation, and opening to her commerce, new, and hitherto unexplored regions for enterprise. All this for England, at least, must be accomplished, before it can be said, that she possesses an Architecture in accordance with the spirit of the age. Nay, more than this is requisite; it must also be conformable to the wants and circumstances of *other* climates, or it would not meet the demands of the age, and be *commercial*.

Now, how far does existent Architecture answer to this

description? The beauty it exhibits, cannot at least be said, to be born of the spirit of *this* age; neither can the utilities it embraces, be said to thoroughly satisfy the requirements, especially those of the domestic, of modern society:—it does not, to any extent, commensurate with the vastness of its operations, call into activity the manufacturing energies of the country:—and what, it may be asked, does existent Architecture do for Commerce? It freights a few ships annually with foreign marbles—it brings these commodities into our markets—and it exports, nothing!

In the Metallurgic Architecture, on the contrary, may now be realized, the highest and most comprehensive order of beauty, in combination with all customary, and many hitherto unattained utilities, united with all requisite *economy*:—but, such an Architecture must also of necessity call into operation, a much larger amount, and greater diversity of artistic and manufacturing skill and industry, than any preceding architecture,—and, alone, in contradistinction to all others, possesses the peculiarity of being *commercial*.

There is now in course of preparation in this country for the Emperor of Russia at St. Petersburg, one of the largest *iron bridges* ever constructed.—Henceforth we may not only send bridges, but palaces, churches, and houses, thither and elsewhere. We export cargoes of metal goods, to Constantinople; and henceforth we may send houses and public buildings of every kind, and save their cities, from the effects of the tremendous fires, by which they are so

frequently devastated. Iron houses of simple character are already exported to our colonies for the purposes of safety and comfort; henceforth, and herein,—we may successfully implant our own peculiar arts amongst them, and unite with the peculiar utility attendant upon such constructions, the additional gift of a beauty, which shall satisfy the minds, and tend to the general improvement, of their inhabitants.

The energy and enterprise of Great Britain is already supplying the several nations of the continent with railroads, and iron ships; and she has now an opportunity of employing them for *the conveyance* of the productions of an Architecture, which, both in the circumstances of its origin, and from the extraordinary facilities she possesses for its accomplishment, may truly and emphatically be called—*her own*.

But, it may be said, these advantages are remote. If they prove so, then it must be attributable to the apathy, want of genius, and prejudices of her people; for it can now no longer be said—it is for want of a system of Architecture, that shall enable her to secure them to herself—by employing in the advancement of art—the resources with which nature and persevering industry has endowed her.

Having briefly glanced at some of the peculiar advantages resulting to society in general—from the practice of the Architecture in question—it may now be inquired—“what is the effect which the introduction of such a system is calculated to have on the character and profession of the Architect?”—and in order to arrive at a just conclusion on this head, it

will be necessary to take into consideration, the present condition, and the future hopes and prospects of the *profession*, in the perpetuation of existing systems alone ; and that to which it is possible for it to attain, by the additional resources presented to it in *the new*.

The manipulations of art in Architecture, unlike those of Painting and Sculpture, *not* requiring the hand of the artist, but merely, that of the ingenious mechanic in the accomplishment; it is obvious, that it is only such works as exhibit originality, in idea and conception, that can be viewed as the legitimate productions of the genuine Architect—being what he ought to be, *an artist*. The practice of Architecture was unquestionably to the Greeks—that of *an art* :—to the Romans and Italians, perhaps, *an art* :—and to the so-called, and original, Gothic Architects, particularly so, *an art* :—but, if we look for the true characteristics of art in the present practices of Architecture, how different is the result. Instead of the exercise of the powers of invention, in the production of originality, in *form* and *feature*, we find, that even the utmost that can usually be attained, is what is termed “ original treatment,” consisting in little, or nothing more, than the imitation and re-arrangement of the concomitant parts of previous productions. If invention be essayed, the Architect is immediately met by the mortifying reflection, that his originality is but inferiority to the excellence, ages since attained.

of genius among modern practitioners ; but, if the *true* cause be investigated, it will rather be found to reside in the circumstance, of their efforts being limited to, and restrained by, the employment of a material—in which art, in design and construction, has so long and so variously essayed her powers, that its capabilities, for any real advancement in originality and excellence, are evidently exhausted—and to the hitherto total absence, from the philosophy of art, of any just, adequate, and distinctive principles, adapted to the properties of bodies, of different nature. and more enlarged capabilities, in application to the systematic, and uniform purposes of Architecture.

That, which was once among the noblest of professions, when dignified by the continual operation of inventive and progressive art, is, from these causes gradually sinking, into the state in which it is already beginning to be viewed—namely, at best, but the pursuit of mechanical science. For, the power of *imitating* previous productions in Architecture is not art ; neither ought it, in justice, to be termed science : for the Chinese, without any knowledge of the principles upon which it is based, but by the power of mechanical imitation alone, would, if required, produce a perfect fac-simile of a Grecian temple ; and it is this power, which, from the increasing intelligence and resources of our own mechanics, is year by year, becoming more formidable to the profession of the architect ; and which every book that is published for his information and instruction, tends at

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the same time to facilitate. It is art alone that can uphold the dignity, and save the profession of the architect from being supplanted by those who are not artists ; and art, it would seem, has already expended her energies in the use of the material, hitherto employed as the primary constituent of all architecture.

Such, in brief, is the present condition, and the future prospect of the architect in masonry.

Now, what advantages can be expected to result to the profession, by the practice of the system herein set forth. Its capabilities, in respect to the *exercise and extension of art*, whether viewed in relation to the source from whence *its forms* are derived, or to the almost unlimited facilities of *its materials*, for the production of peculiar beauty in effect; and the union of that beauty with the essential utilities of architecture, are, as will at once be seen, inexhaustible. It presents to the architect a new and untrodden field for the exercise of genius : it places a new world of forms at his disposal : it gives him art, higher, purer, more unlimited art, than heretofore, to rest his fame upon—and in so doing, will enable him to restore his profession to its primal dignity, and to the justly elevated position it formerly occupied. And, while in the application of existent systems, the exertions of the architect are, with very few exceptions, limited to the requirements of home,—this system, from its being available to commerce, its productions forming fitting objects for exportation, present to him a new and almost boundless field for his exertions.

his fame, and the source of his justly earned recompence.

It may perhaps be asserted, that the peculiar economy of metallic manipulation in architecture, arising out of the circumstance of its respective parts being produced by the process of *modelling* and *casting*, necessarily facilitates the repetition of productions, and the several parts of productions, and might so be brought to affect the demand for original designs,—but so long as excellence can be attained, the natural desire for novelty implanted in mankind, will unquestionably induce the public to prefer originality to repetition ; and unless the peculiarity in question was found to attach to the system under consideration, the patronage of the architect must be limited to his native shores :—for his productions could not possibly be exported.

The art of engraving presents, in this respect, the closest analogy, except indeed that it may be said to owe its existence to the power of multiplication ; as its products form no inconsiderable items in our exports. Has this, been found to degrade, or injure the practice of the elder art of painting, or any other art?—but on the contrary :—has it not, by calling them into activity—by furnishing artists with employment—by spreading their renown—by facilitating instruction—and cherishing the love of art amongst the people of all nations—done more to promote the best interests of art in general, than perhaps any other event, or series of circumstances, could have conspired to accomplish.—If then the representation, in a form which renders it commercial, of a landscape, a statue, or the representation of a work of



architecture, and the consequent multiplication of such, in order to meet the demands of commerce, be not degrading and injurious to art in general—neither is it possible, that the *realities* of a metallurgic and consequently of a *commercial* architecture, can produce such a result.

It has been said, that this system will take away the employment of masons ; but it is most absurd to imagine that those pursuits could possibly be annihilated at once : masonry will always be practised :—even the alteration, repair, and completion of existing structures, would well nigh furnish employment for the present race of masons,—the number of whom, according to the course of nature, will yearly diminish ; and, if there be a diminution of masonic employment, the rising generation may be instructed in more profitable means of livelihood ; for there is by no means sufficient superiority, either moral, intellectual, or physical, in the pursuits of masonry over those of other departments of ingenious and honest industry, to justify the perpetuation of the former to the detriment of more extensive and perhaps important occupations, (that of modelling for instance, for which this system offers such abundant employment), and the sacrifice of the interest of the community at large.

To persons of reflective mind, accustomed to take enlarged and just views of the interests of society, any observations of similar nature to the preceding, are so utterly superfluous, that they would not have been here inserted, did not daily experience prove, the zeal with which pri-

vate prejudice and sinister interest, will oppose such objections to the advancement of any thing great and important, and the aptitude with which many kind and well-intentioned individuals receive and adopt the delusive sophisms—in total forgetfulness of the great duty devolving upon all, of promoting the *universal good*, and of aiming, in every endeavour, to advance the interests of *the many*, rather than those of *the few*.

On reviewing the subject *briefly*, but it is hoped *clearly*, set forth in the preceding chapters, it cannot fail to be perceived, that there is now presented to the people of this country, an enterprise of vast and incalculable importance;—an enterprise peculiarly fitted for the inventive powers of man, as well as to the various other resources of Great Britain;—and affording the widest and most ample scope for their development;—and, an enterprise more glorious in its capabilities and results, than at any one period, is known to have presented itself, throughout the whole history of art.

All the existent Architectures are known to have been of gradual growth; and, being based upon the properties of the same material, they are all primarily, and to a certain extent, synonymous; for they are necessarily constrained within the limited capabilities of the same. Viewed in this light, as well as in the circumstances of their historical progression, the distinctive styles of Architecture appear but as modifications one of another: the Egyptian doubtless of the Hindoo, and the various other nations

which preceded it; the Greek of the Egyptian; the Roman of the Greek; and the Gothic, beautiful, and dissimilar as it is, is known to have arisen out of the gradual corruption of them all.

It is not, that the sublime, that the magnificent, that the beautiful, cannot be realized in the material of stone; for, from the earliest ages of the art, to the present time, each, if not all of these attributes, have been developed; and developed in so infinite a variety of ways, as that it would now appear *almost impossible to extend them*. The progress of art, in the use of stone, has unquestionably become arrested by nature, which in this material hath said—"thus far shalt thou go, but no further." But, while nature—

"the source, the end, and test of art,"

has herein set up a barrier to its extension, which the united genius and energies of men cannot pass—she gives to that art which would follow her dictates, (and science and human ingenuity are continually occupied in *perfecting* the gift) other resources, other elements, in and by which it may be enabled to advance onwards to the attainment of higher excellence.—And when nature points the way, shall man refuse to follow,—shall he refuse to employ the gifts bestowed upon himself in the furtherance of her intentions,—shall he suffer the force of habit, the prejudices of education, or even his just and honorable pride in antiquity, to place an undue restraint on the inventive powers given to him, not to lie dormant, but to be exercised for the benefit of himself and his fellow creatures?—No, it cannot be thus, with the en-

#### ADVANTAGES OF THE METALLURGIC ARCHITECTURE.

lightened and gifted architects and artists of Great Britain, or with the British people,—who, if they really desire to promote their own true interests, (and in this they are seldom found deficient,) will undoubtedly assist in this important undertaking. That which the world has never yet had, is now within the reach of ourselves,—and it is nothing less than *a really NEW Architecture*,—based upon *different* principles, employing *different* elements,—producing *different* effects,—and embracing further *utilities*, than those of which we are in possession,—an Architecture adapting to its uses the most abundant of our native products,—employing to the greatest possible extent the artists, artisans, and manufacturers of our country,—and opening *a new field* for the *extension of the commerce*,—which has already made our own the greatest among the nations of the earth,—an Architecture, therefore, in accordance with the spirit of the age, and the genius of the British people,—an Architecture, which, in relation to those previously existent, possesses in its nature, its attributes, and its essence, the greatest *unity*,—an Architecture, moreover, partaking more of the character of a *fine art*, than any other; and by the practical realization of which, the patrons and practitioners of Architecture have now an opportunity of becoming the honored instruments of promoting the glory of their country, and the usefulness of their age, by the extension of the benign and humanizing influences of the fine arts—in the production of *a new and peculiar order of beauty*.

## APPENDIX.

The Author of the System of Architecture referred to in the foregoing chapters, while promulgating the primary principles upon which it is founded, feels it his duty, in consequence of the absence of all precedent of any similar case, to furnish as clear and intelligible an explanation as possible, of the manner in which the same is protected by *patent*—in order to prevent parties from being tempted into a violation of the same, from want of acquaintance with its nature ; and also, to satisfy such, as judging from the metaphysical character of true art, may be unable to conceive, how, or by what means, the existing laws of patent can be brought to protect it.

In the first place, it will be requisite to bear in mind, that the new art or architecture, is *one thing*; and the manner in which it is viewed according to law, and protected by patent is *another*.

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The law of patent recognizes, *the intentions* of inventors ; and protects the means by which those intentions, are to be realized. Now, in the discovery, or invention of a new architecture, it is almost impossible, but that there should be *several intentions*. The law, however is satisfied with *one* ; and does not inquire whether that intention is primary or secondary ; so that it is proved to be an intention, on the part of the inventor.

The *SYSTEMATIC production of certain optical effects*, occasioned by the projection of the shadows of forms, or the modification of such shadows of the various extraneous or decorative parts or features of houses or other buildings, *on other forms or parts, planes or surfaces of the same—is the intention which the law in this instance protects.*

Now, altho' it may be, that effects, of a somewhat similar nature are occasionally observable, in some of the parts of pre-existent architectures, as for example, (tho' one of rare occurrence) from the perforated flying buttresses of the gothic ; or from the ballustrades or columns of the classic ;—*yet* the production of uniform, and systematic optical effects, of the character previously referred to, is evidently *not* an intention of any known, or commonly practised style, or system of architecture : and this is fully proved by the fact, of all the decorations and details of the existent architectures, being executed in relieve ; or carved out on the surface of a block ; or moulded to produce a similar effect :—and, consequently the outlines and forms of parts, decorations,



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mouldings or patterns so executed, forming part of an opaque and solid mass, cannot possibly be projected in shadow. Forms of this description have their peculiar shadows; but these do not project the perfect forms or outlines of such parts or features, because the block or surface out of which they are carved or moulded, and upon which those shadows are necessarily projected, is an indispensable and integral part, or continuity of such form.

In consequence of the nature of various appendages employed in ordinary building, such as balconies, rails, lattices, veranders, etc., effects of somewhat similar character are also observable; but there exists no evidence to prove, that the systematic production of such shadows or effects, was the intention sought to be carried out in such erections; indeed, the absence of such intention is proved, not only by the actual and tangible uses, or purposes, to which all such productions are applied,—but also from the fact of nearly all mechanical constructions of this nature, being restricted only to certain parts of the work to which they are attached, and those usually the lower or basement portions of edifices, which, according to all known principles of art in building, (*i. e.* architecture) are required to exhibit the smallest amount of decoration;—art in this respect following the analogies furnished in the productions of her prototype, nature, arranging the most beautiful features of her works in the heads or upper portions thereof.

But, again, even granting for the sake of argument, that



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the production of the before mentioned species of optical effect, could be proved to be the intention or purpose for which balconies, lattices, veranders, etc., have, prior to this discovery or invention, been erected,—yet such constructions, although allowable as adjuncts, form no part of any pre-existent system of architecture. Architecture being an art, (employing and adapting, in greater or lesser degrees, known and positive science to her purposes) but nevertheless, an art, realizing the beautiful, or endeavouring to realize the beautiful, by the systematic arrangement and distribution throughout the whole, especially the more elevated portions of her productions, of various parts, features, and decorations of harmonious keeping and character, the majority of which have no actual and palpable utility, further than as regards the improved appearance or effect of the entire work. By such means it is, that the intentions of art, of architecture, are realized.

The protection, therefore, afforded by the patent in question, is not as will be seen, limited to any particular description of forms, (except in so far as they are applicable to, or may be brought to result in the production of the aforesaid description of Optical effects); for, while, as has been previously explained, *the art* in general rejects the forms, as well as the methods of execution, of all the pre-existent architectures, as unfitted for its purposes, *the law* which is brought to protect it, viewing those forms *not* superficially, but integrally, and viewing further the *intention*

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hitherto sought to be fulfilled in the application of such forms, forbids any modification of the same, as well as of all other forms, from being effected and applied to the production of the aforesaid *description of optical effect*.

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It is scarcely necessary to add, that the patent in question does *not* affect the production of designs and experimental models; provided they are not on a scale to render them fitted for application to any of the real purposes of architecture.

The Author of this System therefore most cordially and respectfully invites, to such application of the principles previously set forth, all artists, who, being actuated by the laudable desire of promoting the extension of art, may feel disposed to illustrate them; and will be most happy to render to any practitioners of the art, whatever assistance which, by private advice, information, etc., he may have it in his power to afford; and also to grant to any Architect of established reputation, or who shall exhibit proof of general competency and skill; and who may be professionally called upon to conduct the *practical operations of this Architecture*, the LICENCES required by law for the same, under the patent; in respect to which, application is requested to be made to *Alexander Prince, Esq., 14, Lincolns Inn*

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In consequence of the patent in question (which has subsequently been extended to the Continent) securing to the inventor of this art, the exclusive right of *preparing* the parts and features of its productions, as well as of *applying* them in the construction and arrangement of houses and other buildings, the requisite licences will embrace the twofold privilege of *preparing* and *applying*; without which all such proceedings are necessarily illegal; and by which the Architect in this art, is protected from the liability, of having a greater number of casts taken from his models, than he is desirous of authorizing.



## ERRATA.

Pages 2, 9, and throughout, for *enquiry* read *inquiry*.

„ 42, 43, and throughout, for *preponderance* read *pre-dominance*.

„ 77, second line from the top, place the comma after the word *being*, instead of that of *imaginative*, and substitute a capital for the small *b*.

„ 82, seventh line from the top, omit the monosyllable *in*, previous to the words *vital excellence in all art*.

The Author has also to regret that numerous errors in the punctuation, especially the superfluous introduction of inverted commas, and of periods and capital letters, in places where colons and small letters would be more appropriate,—have been overlooked, in the haste with which it was found requisite to forward the work through the press; and from the attention having been almost exclusively directed to rendering the wording of the text intelligible.